

PROPOSED Resource Management Plan and FINAL Environmental Impact Statement for the Lander Field Office Planning Area



Wyoming Wind River Bighorn Basin District – Lander Field Office

Volume 1 of 2
Chapters 1 - 3

February 2013



The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

**Proposed Resource Management Plan and
Final Environmental Impact Statement
for the
Lander Field Office Planning Area**

**Volume 1 of 2
Chapters 1 - 3**

**U.S. Department of the Interior
Bureau of Land Management
Lander Field Office, Wyoming**

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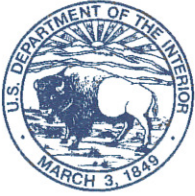
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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Wyoming State Office

P.O. Box 1828

Cheyenne, Wyoming 82003-1828

In Reply Refer To:
1610 (930)

February 22, 2013

Dear Reader:

Attached for your review is the Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) for the Lander Field Office. The Bureau of Land Management (BLM) prepared the Proposed RMP in consultation with cooperating agencies, taking into account public comments received during this planning effort. This Proposed RMP provides a framework for the future management direction and appropriate use of BLM-administered lands and resources within Fremont, Natrona, Carbon, Sweetwater, Hot Springs, and Teton counties, Wyoming. The document contains land use planning decisions to facilitate management of the public lands and resources administered by the Lander Field Office. The Proposed RMP is open for a 30-day review and protest period beginning the date the United States Environmental Protection Agency (EPA) publishes the Notice of Availability.

The BLM developed this Proposed RMP and Final EIS in accordance with the National Environmental Policy Act of 1969 and the Federal Land Policy and Management Act of 1976. The Proposed RMP is largely based on Alternative D, the Preferred Alternative in the Draft RMP and EIS, which was released on September 9, 2011. This Proposed RMP and Final EIS contains the proposed plan, potential impacts of the proposed plan, summary of the written comments received during the public review period for the Draft RMP and EIS, and summary responses to those comments. To aid the reader, substantive changes made between the Draft RMP and EIS and the Proposed RMP and Final EIS are shaded grey.

Instructions for Filing a Protest

Any person who participated in the planning process for this Proposed RMP and has an interest that is or could be adversely affected, may protest approval of this Proposed RMP and land use planning decisions contained therein (see 43 Code of Federal Regulations [CFR] 1610.5-2) during the 30-day protest period. Only persons or organizations who participated in the planning process leading to the Proposed RMP may protest. The protesting party may raise only issues submitted for the record during the planning process leading up to the publication of this Proposed RMP. These issues may have been raised by the protesting party or others. New issues may not be brought into the record at the protest stage.

Protests must be filed with the BLM Director in writing. Regular mail protests should be sent to: Director (210), Attn: Brenda Williams, P.O. Box 66538, Washington, D.C. 20035. Overnight mail should be sent to: Director (210), Attn: Brenda Williams, 1620 L Street, NW, Suite 1075, Washington, D.C. 20036. E-mail and fax protests will not be accepted as valid protests unless the protesting party also provides the original letter by either regular or overnight mail postmarked by the close of the protest period. Under these conditions, the BLM will consider the e-mail or fax protest as an advance copy and it will receive full consideration. If you wish to provide BLM with such advance notification, please direct e-mails to bhudgets@blm.gov and faxes to (202) 452-5112, Attn: BLM Protest Coordinator.

All protests must be postmarked on or before the end of the 30-day protest period following EPA publication of this notice.

IMPORTANT: In accordance with 43 CFR 1610.5-2, the protest must contain the information described in the following critical elements checklist:


- ☐ The name, mailing address, and telephone number of the person filing the protest.
- ☐ The "interest" of the person filing the protest. (How will you be adversely affected by the approval of the resource management plan?) .
- ☐ A statement of the part(s) of the Proposed RMP, and the issue(s) being protested. (To the extent possible, this should reference specific pages, paragraphs, sections, tables, maps, etc., which are believed to be incorrect or incomplete.)
- ☐ A copy of all documents addressing the issue(s) that the protesting party submitted during the planning process OR a statement of the date they were discussed for the record.
- ☐ A concise statement explaining why the protestor believes the BLM State Director's proposed decision is incorrect.

All of these elements are critical parts of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents, or available planning records (e.g., meeting minutes or summaries, correspondence, etc.). To aid in ensuring the completeness of your protest, a printable protest checklist is available online at www.blm.gov/wy/st/en/programs/Planning/rmps/lander/docs.html.

The BLM Director will make every attempt to promptly render a decision on the protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The decision of the BLM Director shall be the final decision of the U.S. Department of the Interior.

Upon resolution of any protests and a determination a Supplemental Proposed RMP and Final EIS is not warranted, an Approved Plan and Record of Decision will be issued. The Approved Plan will be mailed to all who expressed an interest in receiving a copy. The document will be available to all parties through the "Planning" page of the BLM national website, www.blm.gov, or by mail upon request.

Sincerely,



Donald A. Simpson
State Director

Resource Management Plan Protest Critical Item Checklist

**The following items *must* be included to constitute a valid protest
whether using this optional format, or a narrative letter.
(43 CFR 1610.5-2)**

BLM's practice is to make comments, including names and home addresses of respondents, available for public review. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be advised that your entire comment--including your personal identifying information--may be made publicly available at any time. While you can ask us in your comment to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations and businesses, will be available for public inspection in their entirety.

Resource Management Plan (RMP) or Amendment (RMPA) being protested:

Name:

Address:

Phone Number: ()

Your interest in filing this protest (how will you be adversely affected by the approval or amendment of this plan?):

Issue or issues being protested:

Statement of the part or parts of the plan being protested:

Chapter:

Section:

Page:

(or) Map:

Attach copies of all documents addressing the issue(s) that were submitted during the planning process by the protesting party, OR an indication of the date the issue(s) were discussed for the record.

Date(s):

A concise statement explaining why the State Director's decisions is believed to be wrong:

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Abstract

Lead Agency: U.S. Department of the Interior (DOI), Bureau of Land Management (BLM)

Type of Action: Administrative (Final)

Jurisdiction: Portions of Fremont, Natrona, Carbon, Sweetwater, Hot Springs, and Teton counties, Wyoming

Abstract: This Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) describes and analyzes alternatives for the planning and management of public lands and resources administered by the BLM, Lander Field Office. The planning area is located in west-central Wyoming, and comprises approximately 6.6 million acres of land in Fremont, Natrona, Carbon, Sweetwater, Hot Springs, and Teton counties. Although Teton County is in the administrative boundary for the Lander Field Office, no BLM-administered surface or mineral estate occurs in Teton County and, therefore, no management is proposed for the lands in this county. Within the planning area, the BLM administers approximately 2.4 million acres of surface estate and 2.8 million acres of federal mineral estate.

Through this RMP revision, the BLM is revising the existing plan (the 1987 Lander Field Office RMP) to address the availability of new data and policies, emerging issues, and changing circumstances that have occurred during the approximately 25 years since the Record of Decision (ROD) for the existing plan was signed. As part of the RMP revision process, the BLM conducted scoping to solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed in the Draft RMP and EIS. Planning issues identified for this RMP revision focus on watershed and air resources management, energy and minerals management, fire and fuels management, invasive species, wildlife and special status species habitat, wild horses, cultural and paleontological resources, visual resources management, land ownership adjustments, access to public lands and travel, recreation and visitor use, livestock grazing, special designations, and socioeconomic conditions.

The Draft RMP and EIS presented alternatives A through D. **Alternative A** is a continuation of current management (No Action Alternative). Under this alternative, the BLM would continue to manage the use of public lands and resources under the existing RMP, as amended. **Alternative B** emphasizes protection of physical, biological, and heritage resources, while providing for comparatively more limited resource development. **Alternative C** emphasizes resource development, while limiting protective management of physical, biological, and heritage resources. **Alternative D** balances the use and conservation of planning area resources.

After careful consideration of both public and internal comments received on the Draft RMP and EIS, adjustments and clarifications have been made to the document, including Alternative D. As modified, Alternative D is now presented as the Proposed RMP in the Final EIS.

Protest: Protests must be postmarked or received no later than 30 days after publication of the U.S. Environmental Protection Agency Notice of Availability in the *Federal Register*.

Refer to the instructions in the letter preceding this abstract for additional information on how to protest. The close of the protest period will be announced in news releases, newsletters, and on the Lander RMP website at www.blm.gov/wy/st/en/programs/Planning/rmps/lander.html.

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Executive Summary

Introduction

This Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) describes and analyzes alternatives for the future management of public lands and resources administered by the Bureau of Land Management (BLM), Lander Field Office. Located in west-central Wyoming, the administrative area covers approximately 6.6 million acres of land in Fremont, Natrona, Carbon, Sweetwater, Hot Springs, and Teton counties. Although a part of Teton County is in the administrative boundary for the Lander Field Office, no BLM-administered surface or mineral estate occur in Teton County and, therefore, no management is proposed for lands in this county. Of the total area administered by the Lander Field Office (planning area), approximately 2.4 million acres are BLM-administered federal surface estate and 2.8 million acres are BLM-administered federal mineral estate. BLM-administered lands in the planning area are intermingled with state and private lands, and are adjacent to the Wind River Indian Reservation (WRIR) and the Shoshone National Forest. While the BLM has Trust Duties for the management of minerals on the WRIR, the BLM does not make management decisions for the WRIR and Trust Duties are conducted independent of this RMP.

Revising existing land use plans is a major federal action for the BLM. The National Environmental Policy Act of 1969 (NEPA), as amended, requires federal agencies to prepare an EIS for major federal actions significantly affecting the quality of the human environment; thus, this Proposed RMP and Final EIS is a combined document. The Final EIS analyzes the impacts of four alternative RMPs for the planning area, including the No Action Alternative (Alternative A) and the Proposed RMP (Alternative D). The No Action Alternative reflects current management under the existing land use plan. The analysis considers a range of alternatives that provide for various levels of physical, biological, and heritage resource protection as well as opportunities for motorized and nonmotorized recreational activities, leasing and development of mineral resources, livestock grazing, and other land use activities.

Modifications in the Proposed RMP and Final EIS

The Draft RMP and EIS was published on September 9, 2011, initiating a 90-day public comment period that was later extended to close on January 20, 2012. During the public comment period, the BLM received and considered comments that touched on a wide range of issues. In consideration of the public comments received on the Draft RMP and EIS, internal review, new guidance, and new information, the BLM prepared this Proposed RMP and Final EIS. Substantive changes from the Draft RMP and EIS to the Proposed RMP and Final EIS are presented in the document as shaded text. A detailed summary of the substantive management changes is provided in Chapter 2. The following provides an overview of the primary management changes from the Draft RMP to the Proposed RMP:

- **Greater Sage-Grouse Management:** Additional protections, including Required Design Features, for greater sage-grouse and their habitat were incorporated to better protect sagebrush habitat for the benefit of all sagebrush obligate species.
- **Right-of-Way (ROW) Avoidance and Exclusion Areas:** Approximately 411,906 fewer acres are managed as ROW exclusion areas and approximately 321,334 more acres are managed as ROW avoidance areas. Avoidance criteria were also added.
- **ROW Corridors:** 50,047 additional acres were designated as ROW corridors.

- **Management of the Hudson to Atlantic City Area:** The management focus in the Hudson to Atlantic City area (referred to as the Government Draw/Upper Sweetwater Sage-Grouse Reference and Education Area in the Draft RMP and EIS) was broadened to protect values beyond greater sage-grouse. The primary changes include additional acreage pursued for mineral withdrawal (406,213 more acres are pursued for mineral withdrawal in the Proposed RMP than in the Preferred Alternative in the Draft RMP and EIS).
- **Mule Deer Management:** The Proposed RMP extends the same seasonal restrictions to mule deer winter habitat as crucial winter habitat.
- **Management of Congressionally Designated Trails:** The Heritage Tourism and Recreation Corridor was replaced by the National Trails Management Corridor (NTMC) which was designed to better meet the nature and purposes of the Congressionally Designated Trails, including a more uniform management approach.

Purpose and Need

The Federal Land Policy and Management Act (FLPMA) requires developing, maintaining, and, as appropriate, revising land use plans for public lands. BLM-administered lands within the planning area are currently managed according to the 1987 Lander Field Office RMP (existing plan). Since the Record of Decision (ROD) for the existing plan, new data have become available and laws, regulations, and policies regarding management of these public lands have changed. In addition, decisions in the existing plan do not satisfactorily address all new and emerging issues in the planning area. These changes and potential deficiencies created the need to revise the existing plan.

The purpose, or goal, of the RMP is to ensure lands administered by the BLM are managed in accordance with the FLPMA and the principles of multiple use and sustained yield. The land use plan establishes management direction for land within an administrative area through desired outcomes and actions needed to achieve them. The reason for revising the existing plan is to address the changes occurring in the planning area and to select a future management strategy that best achieves a combination of the following elements:

- Employ a community-based planning approach to collaborate with federal, state, and local cooperating agencies.
- Establish goals and objectives for managing resources and resource uses in the approximately 2.4 million surface acres and 2.8 million acres of federal mineral estate in the planning area administered by the BLM in accordance with the principles of multiple use and sustained yield.
- Identify land use plan decisions to guide future land-management actions and subsequent site-specific implementation decisions.
- Identify management actions and allowable uses anticipated to achieve the established goals and objectives and reach desired outcomes.
- Provide comprehensive management direction by making land use decisions for all appropriate resources and resource uses administered by the Lander Field Office.
- Provide for compliance with applicable tribal, federal, and state laws, standards, and implementation plans, and BLM policies and regulations.

- Recognize the nation's need for domestic sources of minerals, renewable energy, food, timber, and fiber, and incorporate requirements of the Energy Policy Act of 2005 (Public Law 109-58).
- Retain flexibility to adapt to new and emerging issues and opportunities and to provide for adjustments to decisions over time based on new information and monitoring.
- Strive to be compatible with the plans and policies of adjacent local, state, tribal, and federal agencies and consistent with federal law, regulations, and BLM policy.

Cooperating Agencies and Tribal Consultation

Title II, Section 202, of FLPMA directs the BLM to coordinate planning efforts with Native American tribes, other federal departments, and agencies of the state and local governments as part of its land use planning process. The BLM accomplished coordination with other agencies and consistency with other plans through ongoing communications, meetings, and collaborative efforts with the Interdisciplinary Team, which includes BLM specialists and federal, state, and local agencies. The Lander Field Office extended cooperating agency status to the State of Wyoming, Fremont County, Natrona County, Carbon County, Sweetwater County, Hot Springs County, various conservation districts, federal agencies, and tribal governments. Cooperating agencies provided input during the initial scoping process on issues of special expertise or legal jurisdiction. In addition, cooperating agencies participated in a series of alternative formulation workshops, reviewed draft information and documents, and periodically met with BLM management and resource specialists throughout the revision process to discuss planning issues and provide input to the process.

Section 7 of the Endangered Species Act (ESA) requires that a federal lead agency consult with the U.S. Fish and Wildlife Service (USFWS) to determine whether its proposed action would jeopardize the continued existence of a threatened or endangered species. The USFWS provided a species list to the Lander Field Office for evaluating BLM Section 7 responsibilities. This list is updated at least annually and the RMP revision reflects the most up to date list from the USFWS.

Consultation with Native American tribes is a requirement of FLPMA and BLM guidance. The BLM took steps to contact the tribes and include them in the scoping process. The BLM sent letters to multiple tribes requesting information to be considered in the planning process and inviting them to be part of the planning process through consultation, public scoping meetings, field trips, and meetings with tribal representatives. Representatives from the Lander Field Office followed up on these letters with telephone calls to each tribe. In letters and during the follow-up calls, the BLM stressed the desire for the tribes to review and comment on the Draft RMP and EIS.

Public Involvement

Scoping

The intent of the scoping process is to provide an opportunity for the public, tribes, government agencies, and interest groups to participate in determining the scope and issues to be addressed by alternatives and analyses in the planning process and the EIS. In general, public involvement assists the agency by broadening the information base for decision making, disseminating information to the public about the RMP and EIS, and ensuring that public needs and viewpoints are brought to the attention of the BLM.

The scoping period was from February 13, 2007 to April 16, 2007. The BLM solicited written comments on the RMP revision process, issues, and impacts and held a series of five public meetings in the planning area. The BLM structured the meetings in an open house format, with resource specialists and other representatives of the BLM on hand to personally address questions and provide information to meeting participants.

Public Comment Period on Draft RMP and EIS

A notice of availability announcing the release of the Draft RMP and EIS was published in the *Federal Register* on September 9, 2011, initiating a 90-day public comment period. The BLM later extended the comment period for an additional 45 days, ending the comment period on January 20, 2012. During the public comment period, the BLM held a series of three commenting workshops and five public meetings in September and October 2011, in towns and cities throughout the planning area. During this time, the public was encouraged to review the Draft RMP and EIS and provide comments. The BLM considered all substantive comments received and revised the plan based on certain issues raised in the comments, as presented in this Proposed RMP and Final EIS.

Future Public Involvement

Members of the public with standing have the opportunity to protest the content of the Proposed RMP and Final EIS during the specified 30-day protest period. The ROD will be issued by the BLM following the Governor's Consistency Review and protest resolution.

Issues Addressed

Planning issues identified through the scoping process and other public outreach efforts focus on the demands, concerns, conflicts, or problems concerning use or management of public lands and resources in the planning area. Key planning issues within the scope of the EIS are used to develop alternatives or are otherwise addressed in the EIS. The main issues described and analyzed in the EIS include the following:

Energy and Minerals Management

- What areas are suitable or not suitable for energy and mineral resources development?
- What areas should be offered for oil and gas leasing with Master Leasing Plans?
- What level of development should be allowed in areas suitable for energy and mineral resource development?

Management of Riparian Areas and Water Quality Concerns

- How should riparian areas be managed to protect the integrity of fish and wildlife habitat as well as to protect local water quality?

Livestock and Wild Horse Grazing and Vegetation Management

- How should soil, water, and vegetation be managed to reduce fuel loads and achieve forest health and healthy rangelands while providing for livestock and wild horse grazing and fish and wildlife habitat?

Recreation/Visitor Use and Safety Management

- How should BLM-administered land be managed to provide access for recreation and general enjoyment of the public lands while protecting cultural and natural resources and public safety?

Travel Management, Including Off-Highway Traffic

- How should travel be managed to provide access for recreation, commercial uses, and general enjoyment of the public lands while protecting cultural and natural resources?

Management of Wildlife Habitat, Including Protection of Sensitive Species Habitat

- How should special status species conservation strategies be applied given the BLM's requirement for multiple use management and sustained yield? How will these strategies affect other public land resources?

Access to Public Lands and Management Considerations

- What land adjustments are necessary to improve access and management of public lands?

Management of Areas with Special Values

- What areas, if any, contain unique or sensitive resources requiring special management?

Management and Protection of Public Land Resources While Allowing for Multiple Uses

- How should BLM-administered land be managed to protect natural and cultural resources while fulfilling the BLM's mandate to provide access for multiple uses?

Planning Criteria

Planning criteria are the standards, rules, and guidelines that help direct the RMP planning process. In conjunction with planning issues, planning criteria ensure that the planning process is focused and incorporates appropriate analyses. The criteria also help guide final RMP selection and the BLM uses the criteria as a basis for evaluating the responsiveness of planning options. Planning criteria for this RMP revision are summarized below; the full planning criteria are listed in Chapter 1, Introduction.

- Planning decisions will cover BLM-administered public lands, including split-estate lands where the subsurface minerals are severed from the surface right, and the BLM has legal jurisdiction over one or the other. No decisions will be made relative to non-BLM-administered lands.
- All proposed management actions will be based upon current scientific information, research and technology, as well as existing inventory and monitoring information.
- The RMP will recognize valid and existing rights.
- The planning process will incorporate the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the State of Wyoming as goal statements.

- The RMP will comply with all applicable laws, regulations, and policies.
- A reasonable foreseeable development scenario for fluid minerals will be developed from analysis of past activity and production, which will aid in environmental consequences analysis.
- The RMP revision planning effort will be collaborative and multi-jurisdictional. The BLM will strive to ensure that its management decisions complement its planning jurisdictions and adjoining properties within the boundaries prescribed by law and regulation.
- Decisions in the plan will strive to be compatible with the existing plans and policies of adjacent local, state, federal, and tribal agencies as long as the decisions are consistent with the purposes, policies, and programs of federal law and regulations applicable to public lands. The BLM and cooperating agencies will jointly develop a range of alternatives for resolution of resource management issues and management concerns.
- Areas with special environmental quality will be protected and if necessary designated as areas of critical environmental concern (ACECs), wild and scenic rivers (WSRs) and lands with wilderness characteristics or other appropriate designations.
- The National Sage-grouse Strategy (BLM 2004a) requires that impacts to sagebrush habitat and sagebrush-dependent wildlife species be analyzed and considered in BLM land use planning efforts for public lands with sagebrush habitat in the planning area. The BLM recognizes the Wyoming Governor's designation of the greater sage-grouse Core Area and will cooperate with the State of Wyoming to manage these areas for healthy greater sage-grouse populations. In addition, the BLM will follow applicable greater sage-grouse guidance, including Instruction Memorandum (IM) 2010-012, IM 2012-043, and IM 2012-044, which provide for the conservation of greater sage-grouse and their habitats.

Alternatives Considered in Detail

To comply with NEPA requirements in the development of alternatives for this RMP and EIS, the BLM sought public input and analyzed a range of alternatives, including a No Action Alternative (Alternative A). The BLM conducted a series of workshops with an Interdisciplinary Team comprised of BLM specialists and local, state, and federal cooperating agencies. The BLM and cooperating agencies formulated two alternatives (B and C) that reflect a range of resource use and conservation. The major issues addressed include: (1) energy and mineral resource exploration and development; (2) vegetation and habitat management; (3) land ownership adjustments and trails and travel management; and (4) special designations. Following analysis of alternatives A, B, and C, the Interdisciplinary Team provided recommendations for selecting the Preferred Alternative (Alternative D). Based on comments received during the 135-day public comment period on the Draft RMP and EIS, the BLM revised the Preferred Alternative. As modified, Alternative D is now presented as the Proposed RMP in the Final EIS.

Including the No Action Alternative (Alternative A), the four alternatives analyzed in this Proposed RMP and Final EIS represent differing approaches to managing resources and resource uses in the planning area. Each alternative comprises two categories of land use planning decisions: (1) desired outcomes (goals and objectives) and (2) allowable uses and management actions.

Goals and objectives direct BLM actions to most effectively meet legal mandates, regulations, and agency policy, as well as local and regional resource needs. Goals are broad statements of desired outcomes that are usually not quantifiable. Objectives identify more specific desired outcomes for resources and might include a measurable component. Objectives are generally expected to achieve the stated goals.

Allowable uses are a category of land use decisions that identify where specific land uses are allowed, restricted, or excluded on BLM-administered lands and federal mineral estate in the planning area. Management actions are proactive measures (for example, measures the BLM will implement to enhance watershed function and condition), or limitations intended to guide BLM activities in the planning area. Allowable uses often contain a spatial component because the alternatives identify whether particular land uses are allowed, restricted, or excluded. Alternatives may include specific management actions to meet goals and objectives and may exclude certain land uses to protect resource values.

Alternative A

The No Action Alternative represents continuation of current management and provides a baseline from which to identify potential environmental consequences when compared to the action alternatives. The No Action Alternative describes current resource and land management direction in the planning area under the existing plan. Current management identifies constraints on mineral leasing in the planning area to protect resource values that are incompatible with mineral resources activity. Current management includes nine ACECs and nine WSR eligible waterways. The BLM manages three Special Recreation Management Areas (SRMAs) to protect the recreation setting and provide for specific recreation opportunities. Alternative A allows livestock grazing on 2,324,934 acres in the planning area. The BLM would continue to manage vegetative communities to meet vegetative attributes as identified in the Natural Resource Conservation Service's Ecological Site Guides and utilize vegetation treatments to increase forage production while meeting the Wyoming Standards for Healthy Rangelands. Constraints on resource uses specifically to protect fish and wildlife resources are only used in a few cases under Alternative A, including seasonal limitations on surface-disturbing activities in important habitat and buffers to restrict surface-disturbing activities around greater sage-grouse leks.

Alternative B

Alternative B emphasizes conservation of physical, biological, heritage and visual resources while managing the public lands for multiple use. Resource development and other active land uses would still be authorized, but greater restrictions would be placed on where and how they occur. Alternative B would use a low impact approach to resource management, utilizing natural systems to achieve goals and objectives – particularly towards achieving Wyoming Standards for Healthy Rangelands, proper functioning condition, and forest health – and allow the least amount of infrastructure and human presence as possible. In order to avoid potential lasting impacts from more intensive management, making improvements to resource condition may take longer to achieve than under a more development oriented approach. Compared to other alternatives, Alternative B would preserve the most land area for physical, biological, and heritage resources; would designate the highest number of ACECs and SRMAs; and would be the most restrictive to motorized travel and mineral development.

Alternative C

Alternative C emphasizes resource uses by reducing constraints placed on physical, biological, heritage, and visual resources. Alternative C gives priority to land uses such as oil and gas development, mining, ROWs, and livestock grazing when managing the public lands for multiple use. Fewer restrictions protecting biological, physical, heritage and visual resources would be placed on surface-disturbing and disruptive activities to facilitate land uses and development. Compared to other alternatives, Alternative C would preserve the least land area for physical, biological, and heritage resources – no ACECs are designated and National Wild and Scenic River System (NWSRS)-eligible waterways would not be found suitable and would be managed in accordance with other resource programs without special protections – and it is the least restrictive to motorized vehicle use, mineral development, and livestock grazing.

Alternative D (Proposed RMP)

Alternative D balances the use and conservation of planning area resources. This alternative generally allows resource use if the activity can be conducted in a manner that conserves physical, biological, heritage and visual resources. Alternative D designates the second largest land area as ACECs and emphasizes moderate constraints on resource uses (e.g., mineral development) to reduce adverse impacts to resource values. Fish and wildlife resources under Alternative D, in general, receive more protection compared to Alternative A, especially within important habitat areas including larger buffers around active raptor nests ($\frac{3}{4}$ mile to 1 mile) and greater sage-grouse leks (0.6 mile within Core Area), and increased protections of winter habitat, crucial winter habitat, and migration areas for elk and mule deer. Under Alternative D, the Wyoming Governor's greater sage-grouse Core Area strategy is incorporated into management actions. Additionally, under Alternative D, areas of big game habitat and greater sage-grouse lek habitat are identified for withdrawal from locatable mineral entry. Extensive Best Management Practices (BMPs) and Required Designed Features are also identified under Alternative D that would provide protections for greater sage-grouse, wildlife, and other resources. In areas of high mineral potential, Designated Development Areas are established which emphasize mineral use. In Dubois, mineral activities are limited and the area is closed to oil and gas leasing for the protection of special status species and to support destination recreation associated with bighorn sheep. Congressionally Designated Trails are managed within the NTMC, which applies specific prescriptions to meet the nature and purposes of the five Congressionally Designated Trails in the planning area.

Environmental Consequences

This section summarizes the environmental consequences that would result from implementing each of the four alternatives. The purpose of the environmental consequences analysis is to determine the potential impacts of the federal action under each of the four alternatives on the human environment, while focusing on key planning issues identified by the BLM and raised during the scoping process. The analysis of environmental consequences is arranged by the following resource areas: physical resources, mineral resources, fire and fuels management, biological resources, heritage and visual resources, land resources, special designations, and socioeconomics.

Physical Resources

Physical Resources include air quality, soil, water, cave and karst resources, and lands with wilderness characteristics. Emissions of air pollutants in the planning area would primarily result from oil and gas development, mining, and other mineral development. Emissions associated with these actions would outweigh those produced from other proposed activities. Compared

against 2008 baseline emissions, Alternative B would result in the smallest increase in total air pollutant emissions in 2018 and 2027; however, this alternative would result in the highest carbon monoxide emissions of any alternative. However, limitations on the use of prescribed burning in Core Area would limit this increase. Total emissions estimated under Alternative D would result in the second-smallest increase over the baseline, while Alternative C would result in the greatest increase. Emissions for all analyzed pollutants are estimated to increase over baseline levels in the short term (2018), and then begin to decrease from the short term to the long term (2027).

The Environmental Protection Agency (EPA) has determined that six greenhouse gases (GHGs) are pollutants and subject to regulation under the Clean Air Act (CAA): carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Carbon sequestration through CO₂ injection is not addressed because it was considered too speculative for estimation at the time of analysis. Carbon dioxide, CH₄, and N₂O are the most commonly emitted GHGs by the types of activities that occur in the planning area. Oil and gas production is the major contributor to GHG emissions under all alternatives. Under all of the alternatives, GHG emissions are estimated to increase in the short term (2018) and then begin decrease in the long term (2027). Alternative C is estimated to result in the greatest increase of GHG emissions in the short and long term, followed closely by Alternative A, then Alternative D. Alternative B would result in the smallest increase of GHG emissions. The total estimated GHG emissions under Alternative D in 2018 are approximately 0.01 percent of the total U.S. emissions in 2008. Worldwide GHG emissions, atmospheric conditions, and a variety of other factors contribute to climate change at a global scale, and, therefore, it is not possible to distinguish the impacts to global climate change from localized GHG emissions originating in the planning area.

Impacts to soil resources result from surface disturbance associated with a variety of resource programs including mineral development, road construction, and recreation such as off-highway vehicle (OHV) use. Actions that restrict surface disturbance or restore vegetation on disturbed areas occur under all alternatives and generally are considered to have a beneficial impact on soil resources by limiting erosion. Alternative B is anticipated to produce the least potential adverse impacts to soil resources because management actions are anticipated to result in the least soil disturbance. Based on anticipated surface disturbance, Alternative C is anticipated to result in the most adverse impacts to soil resources, followed by Alternative A. Alternative D, though anticipated to result in more disturbance than Alternative B, would utilize similar erosion-reducing measures and would result in the second-fewest adverse impacts to soil resources. Required Design Features under Alternative D would limit impacts to the soil resource.

Surface disturbance has an adverse impact on water resources when it contributes to offsite erosion and sediment delivery. Management actions under Alternative B would result in the least amount of projected surface disturbance and greatest number of resource use restrictions, and thus the fewest adverse impacts to surface and groundwater quality and quantity. Similarly, based on anticipated surface disturbance, Alternative C would result in the greatest adverse impacts to water resources. Alternative A manages surface-disturbing activities similar to Alternative C. Management under Alternative D is most similar to that under Alternative B, though it would likely result in more adverse impacts to water resources compared to that alternative due to greater total surface disturbance and allowing necessary and mitigated surface-disturbing activities within 500 feet of surface water. Required Design Features under Alternative D would reduce adverse impacts to water quality but less so than the more restrictive management under Alternative B. Under all alternatives, BMPs, watershed enhancement projects, conservation practices, Stormwater Discharge Plans, Weed Management Area Plans, project-specific soil

investigations, water protection plans, and reclamation plans would reduce impacts to soil, limiting adverse impacts to surface water.

Adverse impacts to cave and karst resources result from actions that disturb or destroy these resources or disrupt the habitat of flora and fauna that utilize them. Actions that result in data collection or preservation of cave and karst resources and their associated values are considered beneficial impacts. Designating the Lander Slope ACEC under alternatives A, B, and D would protect cave and karst resources known to be in that area. Under all alternatives, the discovery of significant caves that fall within the protection of federal legislation would be specially managed under a protocol developed to meet preservation needs. Currently, the BLM has not completed a formal survey of cave and karst resources in the planning area.

Lands with wilderness characteristics include those of appropriate size, naturalness and opportunities for solitude or primitive/unconfined recreation that are not within designated Wilderness areas or Wilderness Study Areas (WSAs). The Little Red Creek Complex is the only identified land with wilderness characteristics in the planning area. Alternatives A and C do not propose specific management for the Little Red Creek Complex to preserve its wilderness characteristics. Although Alternative A manages the area as an ACEC to preserve the naturalness of the area, this designation would only result in limited beneficial impacts to opportunities for solitude and primitive/unconfined recreation because it allows motorized vehicle use. Alternative C would not manage the area as an ACEC, which would increase adverse impacts to wilderness characteristics from a variety of resource uses. Under Alternative B, the entire Little Red Creek Complex (5,490 acres) would be managed as non-WSA lands with wilderness characteristics to protect wilderness values. The area would be closed to motorized and mechanized vehicle use while providing access and recreational opportunities that maintain the area's wilderness characteristics. Alternative D manages 4,954 acres of the Little Red Creek Complex as non-WSA lands with wilderness characteristics with similar prescriptions as Alternative B.

Mineral Resources

Implementation of any of the alternatives would result in public lands being opened (a beneficial impact to mineral resources), or withdrawn or segregated (an adverse impact to mineral resources) from locatable mineral activity. Alternative B, due to withdrawals to protect areas with cultural, paleontological, and wilderness resource values, SRMAs, and ACECs would result in the largest acreage recommended for withdrawal from locatable mineral entry (1,632,605 acres), followed by Alternative D (449,068 acres), Alternative A (23,114 acres) and Alternative C (0 acres). The process by which locatable mineral withdrawal occurs is only initiated by the ROD and requires many additional steps (see Chapter 2 for additional information). Approximately 8,634 acres of pre-FLPMA classifications are also recommended for withdrawal from application of the mining laws and would apply under each alternative. These withdrawals, designated by Congress, are not within BLM authority to modify and would continue indefinitely.

Lands in the planning area have been classified as having low, very low, and negligible potential for geothermal development. There could, however, be increased interest in geothermal exploration and development in the planning area over the life of the plan. The primary impacts to geothermal exploration and development – closing areas to leasing or managing areas with restrictions – are similar to those described for oil and gas and, therefore, impacts to geothermal development would parallel those described below under oil and gas.

The potential for oil and gas occurrence in the planning area ranges from high to very low. Adverse impacts to oil and gas exploration and development result from management

actions that restrict or constrain the potential for oil and gas leasing, development, and exploration. Management actions that limit restrictions or maintain areas as open for oil and gas exploration and development would result in beneficial impacts. Limitations and restrictions on surface-disturbing activities for oil and gas exploration and development also apply to geophysical exploration and development. Impacts to oil and gas development and geophysical operations under alternatives A and C are similar in type, although they vary in extent because of the different areas managed as closed to oil and gas leasing and different surface-use restrictions. Alternative C only applies no surface occupancy (NSO) restrictions within ¼ mile of greater sage-grouse leks and around some cultural resources. Adverse impacts to oil and gas exploration and development would be greatest under Alternative B, which closes the greater sage-grouse Core Area to oil and gas leasing. Alternative D would result in the second-most potential adverse impacts to oil and gas exploration, as it closes the second-most acreage to leasing and manages the most area with major restrictions, such as NSO restrictions, applies Required Design Features for the protection of greater sage-grouse and other resources, and applies Master Leasing Plan-derived constraints to 150,782 acres in the Beaver Rim area (Alternative B closes this area to oil and gas leasing).

The planning area contains 42,291 surface acres with phosphate potential; phosphate is the only solid leasable mineral with substantial occurrence and development potential in the planning area. Alternative A closes 10,047 surface acres to phosphate leasing (approximately 24 percent of the area with phosphate potential), Alternative B closes 39,592 acres (approximately 94 percent of the area with phosphate potential), Alternative C closes 1,721 acres (approximately 4 percent of the area with phosphate potential), and Alternative D closes 42,164 acres (approximately 99 percent of the area with phosphate potential). Alternative D would result in the largest adverse impact to developing known phosphate resources, followed by alternatives B, A, and C.

The likelihood of any other types of leasable mineral (i.e., coal and oil shale) exploration or development in the planning area is remote. If the BLM receives an application for a federal coal lease, it will require an appropriate land use and environmental analysis, including a coal screening process, to determine whether the area(s) proposed for leasing are acceptable for coal development and leasing (in accordance with 43 Code of Federal Regulations (CFR) 3420.1-4). The Programmatic EIS for Oil Shale and Tar Sands included the southern edge of the planning area as oil shale-tar sand resources; however, the area identified is not economically feasible to produce. Additional evaluation and an RMP amendment would be required for the exploration, development, and leasing of oil shale-tar sand.

Mineral materials (also called salable minerals) include sand, gravel, decorative stone such as common granite or moss rock, and other mineral materials not subject to mineral leasing or location under the mining laws. Implementation of management actions under the alternatives could result in impacts that open, limit, or deny access to and disposal of mineral materials from public lands in the planning area. Such management commonly includes restrictions on surface-disturbing activities or closures to mineral materials disposals. Alternative B has the most adverse impacts to mineral material disposals because the most lands are closed to disposals. Alternative D has the next greatest impacts due to ACECs, the NTMC, and other resource protective areas closed to disposal for the benefit of a broad range of resources. Alternative A has the second fewest adverse impacts, followed by Alternative C, which places no restrictions on disposals other than standard stipulations and has the fewest adverse impacts with regard to ACECs.

Fire and Fuels Management

Fire is an integral part of natural ecosystem function; however, the natural fire regime has largely been suppressed in the planning area. Although the suppression of the natural fire regime is considered an adverse impact to fire ecology, actions contributing to an increase in the incidence of wildfire or limiting the ability to effectively fight wildfires are considered adverse impacts to fire and fuels management. The various alternatives would affect the management of wildfires (unplanned ignitions), prescribed fires (planned ignitions), and the stabilization and rehabilitation of areas following wildland fires. For all alternatives, the use of prescribed fire would be limited in greater sage-grouse Core Area where annual precipitation is below 12 inches, which comprises approximately 70 percent of the planning area. Fire suppression in Core Area is prioritized under all alternatives; therefore the impacts from fire suppression do not vary by alternative in most of the planning area. Alternative B would result in the most adverse impacts to wildfire suppression by restricting suppression tactics; Alternative C would result in the most beneficial impacts to wildfire suppression by allowing the full range of management actions across the planning area not within greater sage-grouse Core Area. Alternatives A and D are more restrictive than Alternative C, but provide similar flexibility to suppress wildfire while also minimizing damage to resources and use full suppression on a case-by-case basis. Conversely, Alternative B would provide for the greatest opportunity to allow fire to return to its natural role in the ecosystem, utilize fuels treatments to protect wildland-urban interface (WUI) areas, and restore certain ecosystems over the long term. Alternative B would also have the highest short-and long-term adverse impacts to areas outside greater sage-grouse habitat.

Restricting the use of prescribed fire would result in adverse impacts to fire and fuels management by limiting its use to meet other resource objectives, while treating areas with prescribed fire would result in beneficial impacts. Alternatives A and C would result in prescribed burns on approximately 300 acres per year. Alternative B would result in the greatest use of prescribed burns (1,000 acres per year) followed by Alternative D (500 acres per year). Under Alternative B, prescribed fire may be restricted in ACECs to protect resource values, but the larger ACEC area under alternatives B and D would also allow the reestablishment of natural fire regimes using natural processes. These alternatives would also emphasize treatments to reduce fuels in the WUI. Specific Required Design Features under Alternative D would beneficially impact fire and fuels management by limiting the size and locations of surface disturbances.

Biological Resources

Biological Resources include vegetation, fish, wildlife, special status species, and wild horses. Vegetation resources analyzed in this RMP revision include forests, woodlands, and aspen communities; grassland and shrubland communities; the management of invasive nonnative species (INNS); and riparian-wetland resources. Long-term surface disturbance would contribute to the decline in abundance, distribution, or health of vegetation communities in the planning area and could increase the presence of INNS. Conversely, vegetation treatments causing short-term surface disturbance would improve vegetation health and diversity over the long term, and may reduce the severity of wildland fires that alter the vegetation communities.

Alternative C would result in the most long-term impacts from surface disturbance, followed by alternatives A, D, and B, a portion of which could result in adverse impacts to forests and woodlands by contributing to the declines in forests and forest health and forest products. Alternative C would allow the most motorized vehicle use and would result in the most new road construction, followed by alternatives A, D, and B; these activities could increase the risk of unplanned ignitions and unauthorized wood cutting. Alternative C, followed by alternatives A, B, and D, implements the most silvicultural practices to actively manage forests and woodlands,

which would benefit forest and woodland health by decreasing the risk of landscape-level wildfires and increasing forest product availability. Alternative C would, generally, result in the most beneficial impacts from active silviculture treatments. Alternative B would provide the greatest beneficial impact to the forest and woodland ecology because it emphasizes natural processes. Alternative D would result in more beneficial impacts to forest and woodlands management than Alternative A because it allows all available tools and silvicultural techniques to maintain forest health, while considering the potential adverse impacts of certain techniques to other resources (e.g., impacts of clear-cuts to soil and riparian-wetland areas).

Management actions that advance active vegetation management would result in beneficial impacts to grassland and shrubland communities, while management that allows long-term surface disturbance or activities that cause vegetation to be removed would result in adverse impacts. Long-term disturbance and vegetation removal would contribute to the decline in abundance, distribution, or diversity of grasslands and shrubland communities. Alternative C would result in the greatest area of long-term disturbance from development, followed by alternatives A, D, and B. In energy development areas, reclamation standards under alternatives C and D address soil stabilization in the interim with a higher percentage of grasses, rather than restoring predisturbance plant communities. Alternative B would result in the greatest chance of successful reestablishment of predisturbance plant community grasses and shrubs following construction. Overall, Alternative B contains the least surface disturbance due to closures of greater sage-grouse Core Area to development and the most proactive management such as vegetative treatments and would result in the greatest beneficial impacts to grassland and shrubland communities, followed by alternatives D, A, and C.

The presence of INNS is considered an adverse impact to other biological resources in the planning area and, in spite of management proposed in this RMP, invasive species are expected to spread under all alternatives. Those alternatives projected to involve the greatest amount of surface disturbance would have the potential to result in the greatest adverse impacts from the spread of invasive species. Based on projected surface disturbance and the types of reclamation requirements imposed, Alternative C would result in the greatest potential for the spread of invasive species, followed by alternatives A, D, and B. Alternative D is projected to result in greater surface disturbance than Alternative A, but contains more stringent reclamation requirements, Required Design Features, and selected BMPs, especially in sagebrush areas, that would result in a reduced potential for the spread of invasive species.

Adverse impacts to riparian-wetland resources arise from surface disturbance associated with mineral resources development, motorized vehicle use, road construction, and livestock grazing that cause a change in riparian-wetland functionality, such as changes in sediment loading rates or hydrology. Impacts from wildlife and wild horses are more localized and site specific than the broad impacts from livestock grazing. Alternative C would result in the greatest projected total surface disturbance contribution to sediment loading, followed by alternatives A, D, and B. Alternative B would result in the greatest beneficial impact to riparian-wetland resources by imposing more restrictions on surface-disturbing activities close to riparian-wetland resources and by instituting more beneficial proactive management actions, such as watershed improvement projects. Overall, Alternative B would result in the fewest adverse impacts to riparian-wetland resources and Alternative C would result in the most. In general, Alternative D would result in more adverse impacts to riparian-wetland resources than Alternative B (which prohibits surface disturbance), but applies more restrictions on surface-disturbing activities and utilizes Required Design Features for added beneficial impacts to riparian-wetland resources, compared to Alternative A.

Fish and fish habitat are directly impacted by activities that generate soil erosion and can increase sediment into fish-bearing waterbodies. Fish habitat is also affected by the amount of vegetative cover along stream banks to regulate water temperatures or vehicles in the stream channel. Alternative B provides the greatest protection from surface-disturbing activities and would have the greatest beneficial impact to fish resources. Alternative C provides the least amount of protection and would have the greatest potential for adverse impacts to fish resources, followed by alternatives A and D. Alternative D is similar to Alternative A, but Alternative D includes increased protection in areas important for other resources (particularly ACEC, WSRs, and WSAs), which would benefit fish resources. Additionally, the Required Design Features under Alternative D would provide added indirect benefits to fish and fish habitat through limitations on the size and locations of surface disturbances allowed adjacent to surface water in the planning area.

The primary adverse impacts to wildlife result from habitat loss or degradation, disturbance/disruption of wildlife during sensitive times, or direct mortality; the primary beneficial impacts to wildlife result from management that restricts surface-disturbing activities in known or potential wildlife habitat and disruptive activities (e.g., motorized vehicle use, recreation, etc.) that can cause the abandonment of nest sites or home ranges. Alternative B minimizes wildlife habitat loss and fragmentation in the planning area (e.g., closing greater sage-grouse Core Area to oil and gas development) the most, followed by alternatives D, A, and C respectively. Under alternatives A, B, and D, timing limitation stipulations (TLS) protect big game crucial winter range and elk winter range. Alternative C includes a TLS for elk crucial winter range protection only, which is a smaller area of protection compared to the other alternatives. Extending the TLS buffer for active raptor nests from $\frac{3}{4}$ mile (under Alternative A) to 1.5 miles would protect an additional 480,406 acres under Alternative B during raptor nesting periods. Alternative D extends this buffer to 1 mile around bald eagle and ferruginous hawk nests. Alternative C restricts surface-disturbing activities in the fewest areas and contains the least management designed to improve wildlife habitat quality. Alternative B designates the most ACECs that preserve wildlife habitat, followed by Alternative D. Alternative C designates no ACECs to protect wildlife habitat. Overall Alternative B would have the greatest beneficial impacts to wildlife, followed by alternatives D, A, and C.

Impacts to special status plants, fish, and wildlife species generally parallel those for vegetation, fish, and wildlife; however, all the alternatives include additional protective management for special status species. Overall, proactive management actions would be most beneficial to special status species under Alternative B, followed by alternatives D, A, and C. Activities that disturb soil and vegetation communities would directly impact special status plants. Alternatives B and D require surface-disturbing activities and facilities to have the smallest footprint possible to minimize the impacts of habitat loss and fragmentation. Alternative B provides the greatest protection from surface-disturbing activities and includes the greatest amount of beneficial proactive management; potential beneficial impacts would be lower under alternatives D, A, and C, respectively. Allowable uses and management actions with potential to degrade water quality in the headwaters of the Wind River would affect special status fish species. Alternative B provides the greatest protection from surface-disturbing activities and would result in the greatest beneficial impacts to special status fish habitat, followed by alternatives D, A, and C. Alternative B would have the greatest beneficial impact because it includes the most proactive management to restore and enhance habitats for special status wildlife species, while Alternative C would have the greatest adverse impacts. While Alternative D applies fewer protections that would benefit special status wildlife compared to Alternative B, surface-disturbing restrictions, special designations, Required Design Features, and other management such as limiting the density of disturbance in greater sage-grouse Core Area, would limit adverse impacts to special status species from habitat

loss and fragmentation. Alternative D also recommends withdrawal of extensive areas from locatable mineral entry, which would benefit special status species in those areas.

The BLM manages wild horses for self-sustaining populations of healthy, free-roaming animals in balance with other uses and the productive capacity of their habitat. Impacts to wild horses include management that affects vegetation for forage, the availability of water, or other habitat components necessary to maintain the health and free-roaming nature of horses at the appropriate management level in Herd Management Areas (HMAs). Alternative B would result in the greatest beneficial impact to wild horses because it would increase forage and support the general free-roaming nature of wild horses through fence removal. Although less so than Alternative B, Alternative D focuses on maintenance of healthy, viable herds and habitat, and emphasizes conservation of physical, biological, heritage, and visual resources with constraints on resource uses that would benefit wild horses. Alternative C, followed by Alternative A, would result in the greatest expansions of infrastructure to support managed grazing and the most human presence in HMAs, resulting in the greatest adverse impacts to wild horses' free-roaming nature.

Heritage and Visual Resources

Heritage and Visual Resources include cultural resources, paleontological resources, and visual resources management. Cultural resources are defined as the places where the physical remains of past peoples can be found. Adverse effects to cultural resources typically result when there is a loss of information and/or a loss of integrity of the resource, including visual and audible intrusions or vandalism. Overall, Alternative C is projected to result in the most surface disturbance and uses reactive management to comply with regulations to protect cultural resources. Alternative A, uses a similar management approach to protect important cultural resources, but also includes proactive management for certain sites. Alternative B relies on proactive management to prevent effects to a wider range of important cultural sites where setting is important, and includes more protective measures for Warm Springs Canyon Flume. Alternative D overall reflects the middle ground between alternatives B and C, providing less protection to Warm Springs Canyon Flume than Alternative B, but also identifying situations in which more protective measures than those specified in alternatives A or C will be used. Similar protections for spiritual, sacred, and traditional sites are provided under all alternatives; however, management would be more effective under alternatives B and D, followed by alternatives A and C, respectively. Additionally, Required Design Features that reduce the extent of surface disturbances under Alternative D would have added beneficial impacts for cultural resources compared to alternatives A and C, but still offer less protections than afforded under Alternative B.

Paleontological resources are defined as any fossilized remains, traces, or imprints of organisms, preserved in or on the Earth's crust, that are of paleontological interest and that provide information about the history of life on Earth. Adverse effects to significant paleontological resources typically result in a loss of information and/or a loss of integrity of the resource. Adverse effects to significant paleontological resources on BLM-administered lands include actions that physically damage or destroy all or part of a resource and lack of protective action, which can result in resource deterioration. Adverse effects also result from increased access to areas containing paleontological resources, which can lead to increased use, erosion, looting, and vandalism. Alternatives B and D would result in the least adverse effects and most resource protection compared to the other alternatives by restricting resource uses in important paleontological areas like Beaver Rim, Bison Basin, Bonneville to Lost Cabin, Lander Slope, and Gas Hills, and by generally restricting surface-disturbing activities and limiting motorized vehicle access. Alternative C provides the least protection and the greatest exposure to direct

effects from surface-disturbing activities, followed by Alternative A. Alternatives A and C also manage the important paleontological areas specifically protected under alternatives B and D on a less protective case-by-case basis. Generally, Alternative D management is between alternatives A and B in that it employs a more proactive management approach than Alternative A, including applying Required Designed Features that would reduce surface disturbance impacts, but does not provide the same degree of protective measures as Alternative B.

Activities that disturb the surface are allowed under all alternatives, and these activities can impact scenic values. Visual Resource Management (VRM) Classes establish a measurable standard for the amount of change allowed to visual resources in a specific area, and comparing VRM Classes to the planning area's Visual Resource Inventory (VRI) Classes, or the baseline for scenic values in the planning area, provides an indicator of the level of impact to visual resources from the alternatives. VRI Classes I or II that are designated as VRM III or IV constitutes an adverse impact to visual resources. This is due to the fact that such a designation exposes these high value scenic resources to a management scenario that allows for moderate to high levels of contrast within the existing environment. Whereas VRI Classes III or IV that are designated as I or II marks a beneficial impact to visual resources. As such, Alternative B would result in the greatest beneficial impact to visual resources, with Alternative D also benefiting scenic values. Alternative C will have the highest level of adverse impact on visual resources with nearly 97 percent of VRI Class I and II areas being managed as VRM Class III or IV. Alternative A has nearly 75 percent of VRI Class I and II areas being managed as VRM Class III or IV. Overall, Alternative B manages the majority of scenic features as VRM Class II, with Alternative D managing slightly less scenic features as VRM Class II than Alternative B. Alternative C would result in the most adverse affect to scenic features by managing most of these areas as VRM Class III or IV.

Land Resources

Land Resources include lands and realty, renewable energy, ROWs and corridors, comprehensive trails and travel management, livestock grazing, and recreation. Included in the lands and realty program are land tenure adjustments (e.g., sales, exchanges, acquisitions), land use authorizations (i.e., leases and permits), withdrawals, classifications, and segregations.

Impacts to the lands and realty program results from implementing the alternatives which include land tenure adjustments, withdrawals, and management that makes realty actions more difficult to complete. The biggest difference among the alternatives is in the segregation of lands to pursue locatable mineral withdrawal. Withdrawals close areas to operation of the General Mining Law and can limit the application of other public land laws (depending upon the withdrawal order) and could result in long-term adverse impacts to the lands and realty program by limiting or restricting lands and realty actions in these areas. Alternative A continues withdrawals identified in the 1987 RMP, but recommends no new withdrawals. Under Alternative B, 1,632,605 acres (68 percent of the planning area) are withdrawn, while under Alternative D, 449,068 acres are withdrawn. Under Alternative C, no new withdrawals are identified and all existing withdrawals except for the Yermo threatened and endangered species withdrawal are allowed to expire. As mentioned under the *Mineral Resources* section above, approximately 8,634 acres are existing pre-FLPMA withdrawals which do not expire and would apply under each alternative. No private lands are identified for acquisition under any alternative; lands that have been proposed for exchange have been identified for disposal in this document.

Renewable energy management focuses on wind energy in the planning area. Direct impacts to wind-energy development result from the designation of renewable energy avoidance and

exclusion areas, actions that prohibit, or otherwise decrease the potential for wind-energy development, and actions that cannot be mitigated to allow for wind-energy development. Alternative C manages the largest area as open for wind-energy development (2,284,235 acres), and would therefore result in the greatest beneficial impacts. Open areas would be similar to Alternative C under Alternative A (2,113,512 acres), but substantially smaller under alternatives D (224,289 acres) and B (41,372 acres). Actions associated with wind-energy development under Alternative D would have Required Design Features identified to reduce the amount and location of surface disturbances for improved benefits for other resources, including greater sage-grouse. General protections that further restrict wind-energy development, such as for wildlife, viewshed, and the establishment of the NTMC, result in Alternative D being much more like Alternative B than Alternative A or C.

ROWs are for infrastructure and facilities, including wind-energy development, that are in the public interest and require authorization for location over, under, on, or through BLM-administered land. Adverse impacts to ROWs and designated corridors result from management actions for other resources that limit, prohibit, or otherwise decrease the potential for ROWs. Alternative C would result in the least impact to ROWs by managing the least area as ROW avoidance and exclusion areas (158,767 acres), followed by alternatives A (272,015 acres), D (1,786,726 acres) and B (2,234,248 acres). Alternative D management of the NTMC would result in similar adverse impacts to ROWs as Alternative B through increased areas excluded for ROW use, although adverse impacts would be less severe under Alternative D compared to Alternative B; impacts associated with management under alternatives B and D would be more severe than those under alternatives A and C.

The trails and travel management program is considered a support function for all BLM resource programs and, as such, the program goals are: provide and improve sustainable access for public needs and experiences; protect natural resources and settings; minimize conflicts among the various users of BLM-administered lands. Because of these somewhat divergent goals, blanket statements of adverse and beneficial impacts are not possible. Instead, impacts to trails and travel management are based on a given area's travel management focus or priority (e.g., resource protection focused or public access focused). An increased resource protection focus for the travel management system would occur on 185,253 acres under Alternative A, 276,338 acres under Alternative B, and 56,247 acres under Alternative C; Alternative D would be similar to Alternative B. For each alternative, the decisions across the remainder of the planning area would result in travel management systems focused on increased access. To manage travel, the alternatives include limitations on certain types of travel; an increased level of travel management (e.g., more areas limited to designated roads and trails or closures to cross-country motorized travel) increases resource protection and decreases access. Alternative B limits the most acreage to designated roads and trails in the planning area (193,704 acres), followed by alternatives A (163,075 acres), D (154,772 acres), and C (50,776 acres). Alternative B also closes the largest acreage to motorized vehicle use (71,761 acres), followed by alternatives D (26,357 acres), A (5,923 acres), and C (5,472 acres); closures are adverse impacts to trails and travel management. Alternatives A and C allow cross-country motorized travel for necessary tasks in areas where motorized vehicle use is limited to existing roads and trails. Alternatives B and D prohibit, with some exceptions, motorized cross-country travel in areas with limited travel designations.

The primary impacts to livestock grazing result from management that alters the area available to livestock grazing, constrains the placement or types of range improvements, changes the number of animal unit months (AUMs) available to operators, alters rangeland health, or changes the cost associated with livestock grazing management. Alternative B would result

in the greatest adverse impact to livestock grazing; Alternative C would result in the greatest beneficial impact. Alternative B places the most restrictions on livestock use of forage and the placement and construction of range improvements. In addition, Alternative B closes lands in elk and bighorn sheep crucial winter range in the Dubois area (Map 3), which would result in the loss of approximately 1,043 AUMs. Alternative C places the fewest restrictions on livestock grazing management and expands the areas where range improvements can be placed for use by grazing livestock. Impacts to livestock grazing under Alternative A would fall somewhere between the other alternatives, and this alternative is the most likely to apply management on a case-by-case basis. Alternative D develops rangeland infrastructure when necessary to implement comprehensive grazing management strategies and avoids projects that would expand grazing on the landscape without a clear link to a comprehensive grazing strategy and consideration of other resources. Under all alternatives, 69,276 acres have been unavailable for grazing since before 1987; these acres do not vary by alternative and are not analyzed in this document. Additionally, all alternatives prioritize management of greater sage-grouse in Dubois, Red Canyon, Lander Slope, Green Mountain, and Core Area for added protection to greater sage-grouse and the ability to maintain a higher degree of residual forage in areas preferred by livestock, such as riparian-wetland areas. Alternatives A and C are all likely to result in a moderate utilization level (41- 60 percent) with utilization levels under Alternative D variable based upon implementation of a comprehensive grazing strategy or as needed to address vegetation objectives. Light utilization levels, generally corresponding to 21- 40 percent would result under Alternative B.

Impacts to recreation are those that affect the recreational setting, the recreational experience of users, or the ability of recreationists to achieve desired beneficial outcomes from the use of public lands. Recreation management under the alternatives reflects the diversity of visitor preferences in the planning area, and adverse impacts to the experience of some recreational users may be beneficial impacts to the experience of others. For example, primitive settings benefit nonmotorized recreation and limit access to motorized recreation. Under all of the alternatives, the amount of acres trending towards an urban/industrialized setting is greater than the amount of acres trending towards a primitive setting. The primitive setting would expand the most under Alternative B, followed by alternatives D, A, and C. Under alternatives A and C, visitor services are least responsive to visitor demands for recreation settings, activities, and/or outcomes, resulting in adverse impacts to recreationists. Alternatives B and D increase visitor services in all important recreation areas and provide allowable use decisions that ensure the future recreational enjoyment of these areas, with the main differences being that Alternative D manages less area towards a primitive setting and identifies fewer actions to enhance wildlife-dependent recreation than Alternative B; however, Alternative D would apply Required Design Features to reduce adverse impacts from surface disturbances and would have increased beneficial impacts in comparison to alternatives A and C.

Special Designations

Special Designations include ACECs, Congressionally Designated Trails, WSRs, and WSAs. The BLM designates ACECs to protect resources, natural systems, and natural hazards (referred to as the ACEC values of concern). Values of concern for ACECs proposed in the planning area include cultural, scenic, and wildlife values. To protect the values of concern, ACECs include restrictions on mineral development and other surface-disturbing activities (e.g., mechanical fuels treatments and ROWs) or motorized vehicle use. Alternative B would designate more area as ACECs than any of the other alternatives, encompassing almost 62 percent of BLM-administered land in the planning area. ACECs designated under Alternative D encompass over 10 percent of BLM-administered land in the planning area, which is twice as much acreage (243,836 acres)

as the area designated under Alternative A (119,622 acres). Alternative C does not designate any ACECs. Alternative B would be the most effective at protecting the values of concern within ACECs by restricting resource uses and activities within these areas, followed closely by Alternative D, and then alternatives A and C, respectively.

The planning area contains the Congressionally designated Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails (NHTs) and the Continental Divide National Scenic Trail (CDNST). Adverse impacts to NHTs result mostly from surface-disturbing activities and, to a lesser extent, increased public access. This may physically destroy parts of an NHT, alter a significant element of an NHT, or introduce elements that diminish the historic integrity of an NHT. Alternative A and C manage NHTs similarly, focusing on protecting the immediate area around the NHTs but not addressing visual impacts farther away from the trails. However, Alternative A applies some additional protective management of NHTs compared to Alternative C, such as designating an ACEC, which avoids major ROWs within ¼ mile. Alternative B provides more protection for the immediate area around NHTs and the extended historic setting, such as excluding ROWs outside of designated corridors within 20 miles of NHTs. Alternative D is more protective than Alternative A or Alternative C, and somewhat less protective than Alternative B. Alternative D protects the historic setting of the NHTs from visual impacts similarly to Alternative B, but to a lesser extent. Alternatives B and D also manage recreational use of the trails for beneficial outcomes and to protect their visual resources, while alternatives A and C do not. Alternative D establishes the NTMC, with limitations on mineral development, ROWs, realty actions, and other resource uses to protect the nature and purpose of the Congressionally Designated Trails. Although the nature and purposes of the NHTs and the CDNST are different, both are supported by the uniform management applied to the corridor. Additionally, Alternative D uses Required Design Features, which combined with the NTMC, include protections similar to those under Alternative B.

Protecting or enhancing their free-flowing characteristics and outstanding remarkable values (ORVs) – including scenic, recreational, and wildlife values – are the primary management objectives for WSR eligible waterways. Recommending a waterway as suitable for inclusion in the NWSRS would have the greatest benefit to eligible waterways. If a waterway is not managed to preserve its suitability for the NWSRS, impacts would vary based on the degree to which overlapping management from other resource programs protect the waterways' ORVs. Overall, Alternative B would result in the most beneficial impacts to WSR eligible waterways, followed by alternatives D, A, and C. Alternative A continues to manage WSR eligible waterways to maintain their ORVs, but does not make suitability determinations to recommend eligible waterways for inclusion in the NWSRS. Subjecting eligible waterways to case-by-case actions under the existing plan may result in contrasting management stipulations, allowing varying degrees of resource uses and development that threaten free-flowing characteristics and ORVs. Alternative B recommends all nine eligible waterways for inclusion in the NWSRS, and would provide the most protection for their ORVs and free-flowing characteristics. Alternative D recommends three eligible waterways (Baldwin Creek Unit, Warm Springs Segment 1, and the Sweetwater Unit) for inclusion in the NWSRS and manages the other eligible waterways to improve characteristics that would improve future suitability classification. Alternative C recommends no WSR eligible waterways for inclusion in the NWSRS and, in general, does not require management of these areas that would preserve their ORVs.

Under all of the alternatives, the BLM manages WSAs under Manual 6330, Management of BLM Wilderness Study Areas, which restricts discretionary activities in WSAs to ensure that their suitability for Wilderness designation is not impaired. Wilderness characteristics include

naturalness and opportunities for solitude and primitive/unconfined recreation. Although there are limited discretionary actions the BLM can take that would affect WSAs, management under Alternative B would result in the greatest beneficial impacts to WSAs by emphasizing resource protection and limiting activities, such as motorized and mechanized vehicle use, that may impact wilderness characteristics. Alternatives A, C, and D include similar management for WSAs, except that Alternative D closes the Copper Mountain and Whiskey Mountain WSAs to motorized vehicle use to better protect wilderness characteristics in these areas.

Socioeconomic Resources

Socioeconomic resources include social conditions, economic conditions, health and safety, environmental justice, and tribal treaty rights.

Impacts to social conditions in the planning area include changes in population, such as fluctuations caused by economic boom and bust cycles; changes in the demand for housing and community services along with community fiscal conditions, which can impact the ability of state, regional, and local governments to supply community services such as education; and changes in community character, culture, and social trends. Social conditions are closely tied to economic impacts, including changes in regional economic output, employment, and earnings, and in tax revenues for the local, state, and federal governments. Earnings, output, employment, and tax revenues due to activities on BLM-administered surface and mineral estate, based on modeling as well as qualitative analysis of economic activity from other sectors, would be highest under alternatives A and C, slightly less under Alternative D, and substantially less under Alternative B. Impacts on the social conditions in the planning area would be greatest from reduced oil and gas development and livestock grazing and increased emphasis on recreational opportunities and land preservation under Alternative B. Conversely, under current management (Alternative A) and Alternative C, more areas open to oil and gas development would bring more job opportunities, greater demand for community services, and greater tax revenues to local governments, allowing them to expand community services to meet the needs of a slightly larger population. Alternative D balances the resource conservation and development approaches, but its impacts to social conditions are generally closer to alternatives A and C.

Programs to manage health and safety include the management of Abandoned Mine Lands (AMLs), coalbed fires, physical hazards, and hazardous substances. Impacts to the health and safety program would result from management that affects the risk of accidents in the areas in which AMLs, geologic hazards, or hazardous waste and materials spills or releases occur. Beneficial impacts to health and safety from management of AML sites and coalbed fires would occur under all alternatives. Under all alternatives, the BLM and Wyoming Department of Environmental Quality (DEQ) will identify and plan for remediation of AML and coalbed fire sites which would result in adverse impacts to health and safety. Under all alternatives, the BLM expects the impacts from management of hazardous substances to be similar. Alternatives B and D would have the least potential for adverse impacts to health and safety as Alternative B closes large portions of the planning area to development, including oil and gas, and Alternative D applies Required Design Features which will have beneficial impacts to health and safety similar, but slightly less beneficial than actions under Alternative B. Alternative C, with the greatest amount of mineral activity, could increase the generation, use, transportation, and disposal of hazardous substances, but spill response plans, stipulations, and applicable laws and regulations would reduce potential impacts.

While minority and low-income populations exist in the planning area, no particular BLM actions proposed under any of the alternatives would result in disproportionate adverse impacts to these populations.

Impacts to tribal treaty rights can include limitations on access to tribal hunting, fishing, or resource collection areas that were reserved by certain treaty. Impacts to such resources are usually identified on a project specific basis, in consultation with the appropriate tribes.

The Next Steps

The Proposed RMP and Final EIS considered all substantive comments received during the 135-day public comment period for the Draft RMP and EIS. Members of the public with standing have the opportunity to protest the content of the Proposed RMP and Final EIS during the specified 30-day protest period. The BLM will issue the ROD following the Governor's Consistency Review and protest resolution.

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Reader's Guide to this Document

Chapter 1. Introduction. This chapter introduces the Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS), describes the purpose and need to which the Bureau of Land Management (BLM) is responding, provides an overview of the BLM planning process, identifies planning issues and criteria, and identifies topics not addressed by this RMP revision.

Chapter 2. Resource Management Alternatives. Chapter 2 describes how the four alternatives (A, B, C, and D) were developed, the components and content of each alternative, and it discusses the alternatives considered but eliminated from further consideration. It also presents a comparative summary of impacts of each alternative. Resource discussions in chapters 2, 3, and 4 are organized according to the following eight resource topics:

1000. Physical Resources – Air Quality, Geologic Resources, Soil, Water, Cave and Karst Resources, and Lands with Wilderness Characteristics

2000. Mineral Resources – Locatable, Leasable, and Salable Minerals

3000. Fire and Fuels Management – Unplanned/Wildfire, Planned/Prescribed Fires and Other Fuels Treatments, and Stabilization and Rehabilitation

4000. Biological Resources – Vegetation, Fish and Wildlife, Special Status Species, and Wild Horses

5000. Heritage and Visual Resources – Cultural, Paleontological, and Visual

6000. Land Resources – Lands and Realty, Renewable Energy, Rights-of-Way and Corridors, Comprehensive Trails and Travel Management, Livestock Grazing Management, and Recreation

7000. Special Designations – Congressionally Designated Trails, Wilderness Study Areas, Wild and Scenic Rivers, and Areas of Critical Environmental Concern

8000. Socioeconomic Resources – Social and Economic Conditions, Health and Safety, Environmental Justice, and Tribal Treaty Rights

Chapter 3. Affected Environment. This chapter describes the Lander Field Office planning area and the existing environmental conditions that could be impacted by the alternatives.

Chapter 4. Environmental Consequences. Chapter 4 forms the scientific and analytic basis for comparing environmental impacts of each alternative, including the No Action Alternative. Impacts generally are described in terms of direct or indirect, short-term or long-term, and minor, moderate, or major, when applicable. Potential cumulative and unavoidable impacts and irreversible and irretrievable commitments also are discussed in this chapter.

Chapter 5. Public Involvement, Consultation, and Coordination. Chapter 5 describes the public involvement process, as well as other key consultation and coordination activities undertaken to prepare the EIS in support of the RMP revision. This chapter also includes a list of preparers displaying the names and qualifications of the people responsible for preparing this Proposed RMP and Final EIS. In hardcopy documents, Chapter 5 can be found on a compact disk (CD) attached to the inside back cover of Volume 2.

Chapter 6. References. This chapter provides full citation information for all references cited within the document. In hardcopy documents, Chapter 6 can be found on a CD attached to the inside back cover of Volume 2.

Glossary. The Glossary defines selected terms used throughout this document. In hardcopy documents, the Glossary can be found on a CD attached to the inside back cover of Volume 2.

Appendices. The appendices include documents that support existing resource conditions or situations, substantiate analyses, provide resource management guidance, explain processes, or provide information directly relevant or supporting conclusions in the Proposed RMP and Final EIS. Maps referenced in the Proposed RMP and Final EIS are included as a separate appendix. In hardcopy documents, maps and appendices can be found on a CD attached to the inside back cover of Volume 2. For CD versions of the document, maps are provided as a separate file on the CD. Electronic versions of the maps are also available on the project website: www.blm.gov/wy/st/en/programs/Planning/rmps/lander.html. Twenty-four appendices are included.

Acronyms and Abbreviations

<:

less than

µg/m³:

micrograms per cubic meter

ACEC:

Area of Critical Environmental Concern

AIRFA:

American Indian Religious Freedom Act

AML:

Abandoned Mine Land

AMP:

Allotment Management Plan

AMS:

Analysis of the Management Situation

ANC:

acid neutralizing capacity

APD:

Application for Permit to Drill

APHIS:

Animal and Plant Health Inspection Service

AQD:

Air Quality Division

AQRV:

Air Quality Related Values

ARPA:

Archeological Resources Protection Act

ASCS:

Agricultural Stabilization and Conservation Service

AUM:

animal unit month

BA:

Biological Assessment

BACT:
Best Available Control Technology

bbl:
barrel

BCF:
billion cubic feet

BEA:
Bureau of Economic Analysis

BIA:
Bureau of Indian Affairs

BLM:
Bureau of Land Management

BLS:
Bureau of Labor Statistics

BMP:
best management practice

BOR:
Bureau of Reclamation

BP:
Before Present

CAA:
Clean Air Act

CBNG:
coalbed natural gas

CDC:
Continental Divide-Creston

CDNST:
Continental Divide National Scenic Trail

CEQ:
Council on Environmental Quality

CFR:
Code of Federal Regulations

CH₄:
methane

CIAA:
Cumulative Impact Assessment Area

CO:
carbon monoxide

CO₂:
carbon dioxide

COA:
Conditions of Approval

CPW:
Citizen Proposed Wilderness

CREG:
Consensus Revenue Estimating Group

CRM:
Coordinated Resource Management

CSU:
Controlled Surface Use

CUA:
common use area

CWA:
Clean Water Act

CY:
cubic yard

dBA:
A-weighted decibels

DCCD:
Dubois-Crowheart Conservation District

DDA:
Designated Development Area

DEQ:
Department of Environmental Quality

DOE:
United States Department of Energy

DOI:
United States Department of the Interior

DOR:
Department of Revenue

EA:
Environmental Assessment

EIA:
Energy Information Administration

EIS:
Environmental Impact Statement

EPA:
United States Environmental Protection Agency

ERMA:
Extensive Recreation Management Areas

ES&R:
Emergency Stabilization and Rehabilitation

ESA:
Endangered Species Act

FCRPA:
Federal Cave Resources Protection Act

FLPMA:
Federal Land Policy and Management Act

FMP:
Fire Management Plan

FMU:
Fire Management Unit

FR:
Federal Register

FRCC:
Fire Regime Condition Class

FRG:
Fire Regime Group

FRO:
Final Reclamation Objective

GCRP:
Global Change Research Program

GHG:
greenhouse gas

GIS:
Geographic Information System

GWP:
Global Warming Potential

H₂S:
hydrogen sulfide

H₂SO₄:
sulfuric acid

HAP:
Hazardous Air Pollutant

HMA:
Herd Management Area

HMAP:
Herd Management Area Plan

HMP:
Habitat Management Plan

HNO₃:
nitric acid

HUC:
Hydrologic Unit Code

IBA:
Important Bird Area

IM:
Instruction Memorandum

IMPLAN:
Impact Analysis for Planning

IMPROVE:
Interagency Monitoring of Protected Visual Environments

INNS:
invasive nonnative species

IPCC:
Intergovernmental Panel on Climate Change

IPM:
Integrated Pest Management

IRO:
Interim Reclamation Objective

ISR:
in situ recovery

kg/ha/yr:
kilograms per hectare per year

KLA:

Known Leasing Area

LAC:

Limits of Acceptable Change

LAU:

Lynx Analysis Unit

lb:

pound

LRP:

Limited Reclamation Potential

MACT:

Maximum Achievable Control Technology

MBTA:

Migratory Bird Treaty Act

mcf:

thousand cubic feet

mg/L:

micrograms per liter

MLP:

Master Leasing Plan

MLRA:

Major Land Resource Area

MMBF:

million board feet

MMBNGL:

million barrels of natural gas liquid

MMBO:

million barrels of oil

MMt:

million metric tons

MOA:

Memorandum of Agreement

MOU:

Memorandum of Understanding

mph:

miles per hour

MW:

Megawatt

N₂O:

nitrous oxide

NAAQS:

National Ambient Air Quality Standards

NADP:

National Atmospheric Deposition Program

NAGPRA:

Native American Graves Protection and Repatriation Act

NASS:

National Agricultural Statistics Service

NCA:

National Conservation Area

NCSL:

National Conference of State Legislatures

NEPA:

National Environmental Policy Act

NH₃:

ammonia

NH₄:

ammonium

NHL:

National Historic Landmark

NHPA:

National Historic Preservation Act

NHT:

National Historic Trail

NISC:

National Invasive Species Council

NLCS:

National Landscape Conservation System

NNL:

National Natural Landmark

NO₂:

nitrogen dioxide

NO₃:
nitrate

NOA:
Notice of Availability

NOAA:
National Oceanic and Atmospheric Administration

NOI:
Notice of Intent

NOLS:
National Outdoor Leadership School

NO_x:
nitrogen oxides

NPS:
National Park Service

NRCS:
Natural Resources Conservation Service

NREL:
National Renewable Energy Laboratory

NRHP:
National Register of Historic Places

NSO:
No Surface Occupancy

NSRE:
National Survey on Recreation and the Environment

NSS:
Native Species Status

NST:
National Scenic Trail

NTMC:
National Trails Management Corridor

NTSA:
National Trails System Act

NTT:
National Technical Team

NWSRS:
National Wild and Scenic River System

O&M:

operations and maintenance

O₃:

ozone

OHV:

off-highway vehicle

ORV:

Outstandingly Remarkable Value

OSA:

Outside Service Area

P.L.:

Public Law

Pb:

lead

PEIS:

Programmatic Environmental Impact Statement

PFC:

Proper Functioning Condition

PFYC:

Potential Fossil Yield Classification

PM₁₀:

particulate matter less than 10 microns in diameter

PM_{2.5}:

particulate matter less than 2.5 microns in diameter

ppb:

parts per billion

ppm:

parts per million

PSD:

Prevention of Significant Deterioration

R.S.:

Revised Statute

R&PP:

Recreation and Public Purposes

RAAT:

Reduced Agent Area Treatment

REA:
Recreation Enhancement Act

REL:
Reference Exposure Level

RFD:
Reasonable Foreseeable Development

RHT&EH:
Regional Historic Trails and Early Highways

RMP:
Resource Management Plan

RMZ:
Recreation Management Zone

ROD:
Record of Decision

ROS:
Recreation Opportunity Spectrum

ROW:
Right-of-Way

RVD:
Recreation Visitor Day

SGIT:
Sage-grouse Implementation Team

SHPO:
State Historic Preservation Office

SLAMS:
State and Local Air Monitoring Station

SO₂:
sulfur dioxide

SO₄:
sulfate

SPM:
Special Purpose Monitoring

SRMA:
Special Recreation Management Area

SRP:
Special Recreation Permit

SVR:

Standard Visual Range

SWAP:

Source Water Assessment Program

TCFG:

trillion cubic feet of gas

TCP:

Traditional Cultural Property

TDS:

Total Dissolved Solids

TLS:

Timing Limitation Stipulation

TMDL:

Total Maximum Daily Load

U.S.:

United States

U.S.C.:

United States Code

UIC:

Underground Injection Control

USDA:

United States Department of Agriculture

USFS:

United States Forest Service

USFWS:

United States Fish and Wildlife Service

USGS:

United States Geological Survey

VOC:

volatile organic compound

VRI:

Visual Resource Inventory

VRM:

Visual Resource Management

WAAQS:

Wyoming Ambient Air Quality Standards

WAFWA:
Western Association of Fish and Wildlife Agencies

WARMS:
Wyoming Air Resource Monitoring System

WGFD:
Wyoming Game and Fish Department

WHMA:
Wildlife Habitat Management Area

WHMP:
Wild Horse Management Plan

WIA:
Wyoming Infrastructure Authority

WLSO:
Wyoming Legislative Service Office

WMA:
Wildlife Management Area

WMP:
Watershed Management Plan

WNV:
West Nile virus

WO:
Washington Office

WRAP:
Western Regional Air Partnership

WRIR:
Wind River Indian Reservation

WSA:
Wilderness Study Area

WSGS:
Wyoming State Geological Survey

WSR:
Wild and Scenic River

WTT:
Wyoming Travel and Tourism

WUI:
wildland-urban interface

WYPDES:

Wyoming Pollutant Discharge Elimination System

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Chapter 1. Introduction

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1.1. Introduction and Background

This Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (EIS) describes and analyzes alternatives for the future management of public lands and resources administered by the Bureau of Land Management (BLM), Lander Field Office. The administrative area is located in west-central Wyoming and includes approximately 6.6-million acres of land in most of Fremont County and some of Natrona, Carbon, Sweetwater, Hot Springs, and Teton counties. Although Teton County is in the large administrative boundary for the Lander Field Office, no BLM-administered surface or mineral estate lands occur in Teton County and the RMP makes no management decisions for Teton County lands. Within the Lander administrative area, the BLM manages approximately 2.4-million acres of public land surface and 2.8-million acres of mineral estate. Please note most acreage figures in this document are approximate and have been rounded to simplify reporting. Shaded text in this document identifies substantive changes between the Draft RMP and EIS and the Proposed RMP and Final EIS.

After passage of the Federal Land Policy and Management Act of 1976 (FLPMA), BLM-administered lands were managed according to the principles of multiple use and sustained yield. Thus, since 1976, the BLM has managed for multiple use and to balance increasing and competing demands for resources on public lands. Current management follows the 1987 Lander Field Office RMP (existing plan) (BLM 1987a). The existing plan has undergone maintenance actions, updates, and amendments. However, the 1987 plan is now out-of-date because of changing circumstances, new information, and new, more modern planning requirements. Thus, as discussed further below, a new RMP is necessary to meet the need for current and future multiple use management of the public lands as mandated by FLPMA and BLM's planning regulations.

1.1.1. Land Ownership within the Lander Field Office Planning Area

BLM-administered surface land in the planning area is intermingled with state and private lands and is adjacent to the Wind River Indian Reservation (WRIR) and the Shoshone National Forest. While the BLM has Trust Duties for the management of minerals on the WRIR, the BLM does not make management decisions for the WRIR and Trust Duties are conducted independently of the RMP. Activities on the WRIR will be considered where appropriate in the cumulative analysis section of this document. Intermingled mineral ownerships, as well as federal minerals under privately owned surface, which are referred to as split-estate land, are located throughout the planning area. County governments have land use planning responsibility for the private lands located within their jurisdictions. Table 1.1, "Acreage of Surface Land within Each Jurisdiction of the Planning Area" (p. 2) and Table 1.2, "Acreage of Subsurface Mineral Ownership within Each Jurisdiction of the Planning Area" (p. 2) contain summaries of the surface and mineral ownership and administrative relationships for the planning area. The approved RMP will not include planning and management decisions for (1) lands or minerals privately owned or owned by the State of Wyoming or local governments or (2) lands and minerals administered by other federal agencies.

Table 1.1. Acreage of Surface Land within Each Jurisdiction of the Planning Area

Agency	Fremont County	Natrona County	Carbon County	Sweetwater County	Hot Springs County	Teton County	Total
Bureau of Land Management	1,933,368	297,981	38,406	122,624	1,831	0	2,394,210
U.S. Bureau of Reclamation	125,666	40	0	0	0	0	125,706
Department of Defense	1,340	0	0	0	0	0	1,340
National Park Service	0	0	0	0	0	0	0
State of Wyoming	239,364	30,042	3,174	5,386	164	0	278,131
U.S. Fish and Wildlife Service	0	112	0	0	0	0	112
U.S. Forest Service	873,947	0	0	0	0	1,658	875,605
Other federal agencies	0	0	0	0	0	0	0
Other (water and private lands)	1,123,148	94,344	3,853	325	44,184	0	1,265,855
Tribal Lands	1,326,018	0	0	0	220,487	0	1,546,505
Total	5,622,851	422,519	45,434	128,335	266,667	1,658	6,487,464

Source: BLM 2012a

Table 1.2. Acreage of Subsurface Mineral Ownership within Each Jurisdiction of the Planning Area

Agency	Fremont County	Natrona County	Carbon County	Sweetwater County	Hot Springs County	Teton County	Total
Bureau of Land Management	2,281,159	364,256	41,482	119,407	2,796	0	2,809,100
Other (state, tribal, and private)	2,468,482	58,279	3,951	8,974	263,747	0	2,803,433
Total	4,749,641	422,535	45,433	128,381	266,543	0	5,612,533

Source: BLM 2012a

1.2. Purpose and Need for the Resource Management Plan Revision

Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1502.13) require the purpose and need of an EIS to “briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” The purpose and need section of this **Proposed RMP** and **Final EIS** provides a context

and framework for establishing and evaluating the range of reasonable alternatives described in Chapter 2.

1.2.1. Need for Revising the Existing Plan

The BLM identified the need to revise the existing plan based on considerations identified in the Analysis of the Management Situation (AMS) (BLM 2009a), an examination of issues identified during the public scoping process, and through collaboration with cooperating local, state, and federal agencies.

Additionally, since the Record of Decision (ROD) was signed (June 1987) for the existing plan, new data have become available, new policies have been established, and policies have been revised. These developments, along with emerging concerns and changing circumstances, resulted in the need to revise the existing plan.

New Data

Monitoring, availability of new information, and advances in science and technology provide new data to consider in the revision of the existing plan. Examples of this new data can be found in the following documents and sources:

- Final Programmatic EIS on Wind Energy Development on BLM-Administered Lands in the Western United States (BLM 2005a) and Final Programmatic EIS for Geothermal Leasing in the Western United States (BLM and USFS 2008), which identify areas within the planning area with wind or geothermal energy potential.
- Lander Field Office Mineral Occurrence and Development Potential Report (BLM 2009b), which identifies areas of mineral potential including locatable minerals, solid leasable minerals, and salable minerals.
- Lander Field Office AMS (BLM 2009a), which identifies areas that require a change in management and areas of potential concern.
- Scientific Inventory of Onshore Federal Lands Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions or Impediments to their Development (DOI 2006a), which identifies constraints on development of oil and gas reserves.
- Reasonable Foreseeable Development (RFD) Scenario for Oil and Gas, Lander Field Office (BLM 2009c), which identifies the historic development of oil and gas resources and the likelihood and location of future development.
- Lander Field Office Visual Resource Inventory Data (BLM 2012a), which provides information about the existing visual resources and its current condition.
- Wyoming Greater Sage-Grouse Conservation Plan (Wyoming Sage-Grouse Working Group 2003), Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (Connelly et al. 2004), and Greater Sage-Grouse: Ecology and Conservation of a Landscape and Its Habitats (Knick and Connelly 2011), which identifies greater sage-grouse habitat, population concentration areas, and connectivity. In 2010, the U.S. Fish and Wildlife Service (USFWS) made a determination that the listing of greater sage-grouse under the Endangered Species Act was warranted but precluded.
- Lynx data for Lynx Analysis Units (BLM 2012a), which identify areas in the Dubois area as having lynx habitat and the potential for native lynx populations.

New and Revised Policies

Numerous policies either have been revised or adopted since the ROD for the existing RMP was signed in 1987 and are important to consider in revising the existing plan. Appendix A (p. 1427) includes a complete list of relevant policies, including new and revised policies. For example, on September 28, 2009, the BLM Washington Office issued Instruction Memorandum (IM) 2009–215 which provided special guidance for land use plans in connection with components of the National Landscape Conservation System with regard to multiple use of those lands. The policy states in part:

A presidential proclamation or act of Congress that designates an area within the National System of Public Lands supersedes conflicting direction by the FLPMA. These designations include, but are not limited to, National Monuments, National Conservation Areas (NCAs), Wilderness Areas, National Scenic or Historic Trails, Wild and Scenic Rivers, Cooperative Management and Protection Areas, Outstanding Natural Areas, National Recreation Areas, Forest Reserves or any other lands described in Public Law 111-11 Sec. 2002(b). Specifically, the land use plan and management direction for such a designation must comply with the purposes and objectives of the proclamation or act of Congress regardless of any conflicts with the FLPMA's multiple-use mandate.

Emerging Concerns and Changing Circumstances

Emerging concerns and changes in local, regional, and national circumstances were considered during the revision of the existing plan, as identified in the Notice of Intent (NOI).

Management under BLM's multiple use mandate can result in conflicts between resource uses, such as energy and minerals management, and resources, such as areas with special resource values like sensitive species habitat. This tension is further compounded by changing conditions in surrounding areas, such as air quality concerns in southwestern Wyoming, greater sage-grouse habitat protection issues, the growing recognition of the difficulty of establishing reclamation following surface disturbance, and the increased potential for the introduction and spread of invasive plant species. Increasing demand for rights-of-way on public land and access for recreational use including travel management issues may conflict with protection of the values of concern in Areas of Critical Environmental Concern (ACECs). Changing demographics and a continuation of the shift from labor income to non-labor income such as retirement and investments may have changed the demands for different types of uses on the public lands. Visual resources are an important component to the quality of life in the community; visual resource management decisions have important implications for development and land use. Guidance and regulations for analysis of lands with wilderness characteristics and waterway segments with wild and scenic characteristics result in the need for public involvement in planning processes associated with these areas. The pace of mineral development and the areas in which development will be authorized have important implications for the local and state economy and are directly related to land use decisions and authorizations. The BLM has issued guidance following oil and gas leasing reform (IM 2010-117) which authorizes analyzing external and internal proposals for Master Leasing Plans (MLPs) in RMP revisions. Both external and internal proposals have been received for having MLPs in different portions of the planning area.

1.2.2. Purpose of Revising the Existing Plan

Section 102 of the FLPMA sets forth the policy for periodically projecting the present and future use of public lands and their resources using the land use planning process. Sections 201

and 202 of the FLPMA and BLM's planning regulations (43 CFR 1600) establish the BLM's land use planning requirements. BLM Handbook H-1601-1, Land Use Planning Handbook, provides more detailed and up-to-date guidance for implementing the BLM land use planning requirements. The purpose of the land use plan is to ensure BLM-administered lands are managed in accordance with the FLPMA and the principles of multiple use and sustained yield. The land use plan establishes management direction for land within an administrative area through desired outcomes and actions needed to achieve them. The reason for revising the existing plan is to address the changes occurring in the planning area and to select a future management strategy that best achieves a combination of the following:

- Employ a community-based planning approach to collaborate with federal, state, and local cooperating agencies.
- Establish goals and objectives for management of resources and resource uses within the approximately 2.4-million surface acres and 2.8-million acres of federal mineral estate administered by the Lander Field Office in accordance with the principles of multiple use and sustained yield.
- Identify land use plan decisions to guide future land-management actions and subsequent site-specific implementation decisions.
- Identify management actions and allowable uses anticipated to achieve the established goals and objectives and reach desired outcomes.
- Provide comprehensive management direction by making land use decisions for all appropriate resources and resource uses administered by the Lander Field Office.
- Provide for compliance with applicable tribal, federal, and state laws, standards, implementation plans, and BLM policies and regulations.
- Recognize the nation's needs for domestic sources of minerals, food, timber, and fiber, and incorporate requirements of the Energy Policy Act of 2005 (Public Law 109-58).
- Retain flexibility to adapt to new and emerging issues and opportunities and to provide for adjustments to decisions over time based on new information and monitoring.
- Strive to be compatible with existing plans and policies of adjacent local, state, tribal, and federal agencies and consistent with federal law, regulations, and BLM policy.

1.3. Planning Process

The BLM is directed by the FLPMA to plan for and manage "public lands." As defined by the Act, public lands are those federally owned lands, and any interest in lands (e.g., federally owned mineral estate), that are administered by BLM. RMPs are developed to address the BLM's mission to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

The RMP provides basic program direction with the establishment of goals, objectives, and allowable uses. The RMP focuses on what resource conditions, uses, and visitor experiences should be achieved and maintained over time. Since this involves considering natural processes with long-term timeframes, the RMP must take a long-term view.

An approved RMP establishes the 1) resource condition goals and objectives, 2) the allowable resource uses and related levels of production or use to be maintained, 3) land areas to be managed for limited, restricted, or exclusive resource uses or for transfer from BLM administration, 4) program constraints and general management practices and protocols, and 5) intervals and standards for monitoring the plan.

Revision of an existing plan is a major federal action for the BLM. The National Environmental Policy Act (NEPA) of 1969, as amended, requires federal agencies to prepare an EIS for major federal actions; thus, this Proposed RMP and Final EIS accompanies the revision of the existing plan. This Proposed RMP and Final EIS analyzes the impacts of four alternative RMPs for the planning area, including the No Action Alternative. The No Action Alternative identifies current status of resources and land uses as well as current management practices (the existing plan). Under the No Action Alternative, current management practices would continue for all resources and land uses. NEPA requires analysis of a No Action Alternative.

The BLM planning process, as set forth in the BLM Handbook H-1601-1, Land Use Planning Handbook (BLM 2005b), is designed to help the BLM identify the uses of BLM-administered lands desired by the public and to consider these uses to the extent they are consistent with the laws established by Congress and the policies of the executive branch of the federal government. The steps in the planning process include:

1. Identification of Issues
2. Development of Planning Criteria
3. Collect and Compile Inventory Data
4. Analysis of the Management Situation
5. Formulate Alternatives
6. Estimation of Impacts of Alternatives
7. Selection of a Preferred Alternative
8. Selection of the Resource Management Plan
9. Monitoring and Evaluation

As part of these steps, the BLM wrote a preparation plan to focus the planning process and provide management direction, oversight, structure, and a cost estimate for the RMP revision. The publication of the NOI in the *Federal Register* on February 13, 2007 announced BLM's decision to prepare an EIS, formally initiated the plan revision, and began the scoping process. The BLM utilized the public scoping process to identify planning issues to direct the revision of the existing plan (see Chapter 5). The BLM also used the scoping process to introduce the public to preliminary planning criteria, which set limits to the scope of the RMP revision.

As appropriate, the BLM collected data to address planning issues and to fill data gaps identified during public scoping. Using these data, the planning issues, and the planning criteria, the BLM conducted an AMS to describe current management and identify management opportunities for addressing the planning issues. Current management, under the existing plan, would continue through selection of the No Action Alternative. Results of the scoping process and the AMS clarified the purpose and need and identified key planning issues that focus planning efforts and that need to be addressed by the RMP revision.

During alternative formulation, the BLM collaborated with cooperating agencies to identify goals and objectives for resources and resource uses in the planning area. These desired outcomes addressed the key planning issues, were constrained by the planning criteria, and incorporated the management opportunities identified by the BLM.

The details of alternatives were developed through the development of management actions and allowable uses anticipated to achieve the goals and objectives. The alternatives represent a reasonable range for managing resources and resource uses within the planning area. Chapter 2 of this document describes and summarizes the alternatives.

The BLM analyzed the impacts of each alternative in Chapter 4. With input from cooperating agencies and BLM specialists, and consideration of planning issues, planning criteria, and the impacts of alternatives, the BLM selected Alternative D as the Preferred Alternative, and published the plan in the Draft RMP and EIS.

A Notice of Availability (NOA) announcing the release of the Draft RMP and EIS was published in the *Federal Register* on September 9, 2011, initiating a 90-day public comment period. The BLM later extended the comment period for an additional 45 days, ending the comment period on January 20, 2012. Following receipt and consideration of public comments on the Draft RMP and EIS, the BLM prepared this Proposed RMP and Final EIS. The BLM prepared a Comment Analysis Report, which summarizes all substantive comments received during the 135-day public comment period and the BLM's responses to those comments, including how the agency revised the RMP and EIS based on comments. The report is presented in Appendix X (p. 1829).

The publication of the NOA in the *Federal Register* for this Proposed RMP and Final EIS began a 30-day protest period and 60-day Governor's consistency review period. The BLM will resolve protests and the Governor's recommended changes and prepare a ROD and Approved RMP.

After issuing the Approved RMP and ROD, an Implementation Strategy will be developed. The Implementation Strategy will include an annual coordination meeting between BLM and the agencies cooperating in the RMP revision. The annual coordination meeting will include an update on implementation of the plan, foreseeable activities for the upcoming year, and opportunities for continued collaboration with the RMP cooperators. Additional coordination meetings may be held as needed.

1.4. Planning Issues

The BLM conducted an early public scoping process to determine the scope of issues to be addressed in this RMP and EIS. Scoping is a collaborative public involvement process to identify planning issues to be addressed in the planning process. As part of the scoping process, the BLM solicited comments and issues (including during five public scoping meetings [see Chapter 5]) from the public, organizations, tribal governments, and federal, state, and local agencies, as well as from BLM specialists. The BLM's Land Use Planning Handbook (BLM 2005b) defines planning issues as "...disputes or controversies about existing and potential land and resource allocations, levels of resource use, production, and related management practices." Issues identified during the scoping and RMP revision process comprise two categories:

- Issues within the scope of the EIS and used to develop alternatives or otherwise addressed in the EIS
- Issues outside the scope of the EIS or that could require policy, regulatory, or administrative actions

1.4.1. Issues Addressed

Those planning issues determined to be within the scope of the EIS are used to develop one or more of the alternatives or are addressed in other parts of the EIS. For example, as planning issues were refined, the BLM collaborated with cooperating agencies to develop a range of reasonable alternatives designed to address and/or resolve key planning issues, such as what areas are suitable for energy and mineral resource development. A range of reasonable alternatives provides various management approaches for how the BLM and cooperating agencies can address this and other key planning issues, including the management of resources and resource uses in the planning area. During the scoping period, the key planning issues identified for developing alternatives in the Draft RMP and EIS are listed below:

Energy and Minerals Management

- What areas are suitable or not suitable for energy and mineral resource development?
- What areas should be offered for oil and gas leasing with MLPs?
- What level of development should be allowed in areas suitable for energy and mineral resource development?

Management of Riparian Areas and Water Quality Concerns

- How should riparian areas be managed to protect the integrity of fish and wildlife habitat as well as protect local water quality?

Livestock and Wild Horse Grazing and Vegetation Management

- How should soil, water, and vegetation be managed to reduce fuel loads and achieve forest health and healthy rangelands while providing for livestock and wild horse grazing and fish and wildlife habitat?

Recreation/Visitor Use and Safety Management

- How should BLM-administered land be managed to provide access for recreation and general enjoyment of the public lands while protecting cultural and natural resources and public safety?

Travel Management, Including Off-highway Traffic

- How should travel be managed to provide access for recreation, commercial uses, and general enjoyment of the public lands while protecting cultural and natural resources?

Management of Wildlife Habitat, Including Protection of Sensitive Species Habitat

- How should special status species conservation strategies be applied given the BLM's requirement for multiple use management and sustained yield? How will these strategies affect other public land resources?

Access to Public Lands and Management Considerations

- What land adjustments are necessary to improve access and management of public lands?

Management of Areas with Special Values

- What areas, if any, contain unique or sensitive resources requiring special management?

Management and Protection of Public Land Resources While Allowing For Multiple Uses

- How should BLM-administered lands be managed to protect natural and cultural resources, while fulfilling the BLM's mandate to provide access for multiple uses?

For a detailed description of all issues identified during scoping, please refer to the Lander Field Office Scoping Comment Summary Report (BLM 2007a). The scoping report is available on the Lander RMP website, <http://www.blm.gov/pgdata/content/wy/en/programs/Planning/rmps/lander.html>.

1.4.2. Issues Considered but Not Further Analyzed

Laws, regulations, policies, and executive orders require specific resource topics be examined during the NEPA process. In some instances, initial evaluation reveals issues that are not relevant to the planning area or do not require further analysis. Examples of these topics are listed below.

Prime and Unique Farmlands – In accordance with the Farmland Protection Policy Act, the BLM determined that no prime or unique farmlands or farmland of statewide or local importance occur on public lands in the planning area. None of the actions proposed in this RMP revision would disturb farmlands; therefore, impacts on prime and unique farmlands were not analyzed further in this RMP revision.

1.5. Planning Criteria

Planning criteria are the standards, rules, and guidelines that help to guide the RMP planning process. These criteria influence all aspects of the planning process, including inventory and data collection, developing issues to address, formulating alternatives, estimating impacts, selecting the Preferred Alternative and the Proposed RMP. In conjunction with the planning issues, planning criteria ensure that the planning process is focused and incorporates appropriate analyses. Planning criteria are developed from appropriate laws, regulations, and policies. The criteria also help to guide the final plan selection and are used as a basis for evaluating the responsiveness of the planning options. Planning criteria used in this RMP revision are as follows:

- The plan will be completed in compliance with the FLPMA (43 United States Code [U.S.C.]1701 et seq.) and NEPA.
- The plan will recognize valid existing rights.
- Public participation will be encouraged throughout the process by collaborating and building relationships with tribes, state and local governments, federal agencies, local stakeholders, and others with interest in the plan.
- Planning decisions will cover BLM-administered public lands, including split-estate lands where the subsurface minerals are severed from the surface right, and the BLM has legal jurisdiction over one or the other. No decisions will be made relative to non-BLM-administered lands.
- The proposed RMP will comply with all applicable laws, regulations, and policies.
- Impacts from the management alternatives considered in the revised RMP will be analyzed in an EIS developed in accordance with regulations at 43 CFR 1610 and 40 CFR 1500.

- The planning process will follow the stages of an EIS-level planning process. For specific information, please see the Land Use Planning Handbook, H-1601-1 (BLM 2005b).
- For program specific guidance of land use planning level decisions, the process will follow the Land Use Planning Manual 1601 and Handbook H-1601-1, Appendix C (BLM 2005b).
- Decisions in the plan will strive to be compatible with the existing plans and policies of adjacent local, state, federal, and tribal agencies as long as the decisions are consistent with the purposes, policies, and programs of federal law, and regulations applicable to public lands.
- The RMP will recognize the State of Wyoming's responsibility and authority to manage wildlife. BLM will consult with the Wyoming Game and Fish Department (WGFD).
- Planning decisions will comply with the Endangered Species Act and BLM interagency agreements with the USFWS.
- The National Sage-grouse Habitat Conservation Strategy (BLM 2004a) requires that impacts to sagebrush habitat and sagebrush-dependent wildlife species be analyzed and considered in BLM land use planning efforts for public lands with sagebrush habitat in the planning area. Management of surface-disturbing and disruptive activities will follow the policy set forth in IMs Washington Office (WO)-2012-044, WY-2010-012, and WY-2010-013 for the protection of greater sage-grouse habitat.
- The planning team will work cooperatively and collaboratively with cooperating agencies and all other interested groups, agencies, and individuals.
- The BLM and cooperating agencies will jointly develop alternatives for resolution of resource management issues and management concerns.
- The planning process will incorporate the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for Public Lands Administered by the BLM in the State of Wyoming as goal statements.
- Areas with special environmental quality will be protected and if necessary designated as ACECs, Wild and Scenic Rivers, or other appropriate designations.
- Any public land surface found to meet the eligibility criteria to be given further consideration for inclusion in the Wild and Scenic River System will be addressed in the RMP revision effort in terms of developing interim management options in the alternatives for the EIS.
- Wilderness Study Areas (WSAs) will be managed under BLM Manual 6330, Management of Wilderness Study Areas, which replaces the Interim Management Policy for Lands under Wilderness Review, until Congress either designates all or portions of the WSA as wilderness or releases the lands from further wilderness consideration. It is no longer the policy of the BLM to make formal determinations regarding wilderness character, to designate additional WSAs through the RMP process, or to manage any lands other than existing WSAs in accordance with BLM Manual 6330.
- The BLM will consider management to protect and maintain lands with wilderness characteristics through the RMP revision process.
- The BLM will protect, manage, and control for a healthy wild horse population consistent with the Wild Free-Roaming Horses and Burros Act of 1971.
- Forest management strategies will be consistent with the Healthy Forests Restoration Act.
- Fire management strategies will be consistent with the Wyoming Fire Management Plan (BLM 2004b).
- Geographic Information System (GIS) and metadata information will meet Federal Geographic Data Committee standards, as required by Executive Order 12906. All other applicable BLM data standards will also be followed.
- The planning process will involve American Indian tribal governments and will provide strategies for the protection of recognized traditional uses.

- All proposed management actions will be based upon current scientific information, research and technology, as well as existing inventory and monitoring information.
- The RMP will include adaptive management criteria and protocol to deal with future issues. Adaptive management is a system of management practices based on clearly identified outcomes, monitoring to determine if management actions are meeting outcomes, and, if not, facilitating management changes that will best ensure that outcomes are met or to re-evaluate the outcomes.
- The planning process will use the Wyoming BLM Mitigation Guidelines to develop management options and alternatives and analyze their impacts, and as part of the planning criteria for developing the options and alternatives and for determining mitigation requirements.
- A RFD scenario for fluid minerals will be developed from analysis of past activity and production, which will aid in environmental consequences analysis.
- Planning and management direction will be focused on the relative values of resources and not the combination of uses that will give the greatest economic return or economic output.

1.6. Related Plans

BLM planning policies require that the BLM review approved or adopted resource plans of other federal, state, local, and tribal governments and, to the maximum extent consistent with federal law and the purposes of FLPMA, be consistent with those plans. The following plans are related to the management of land and resources and apply to this RMP revision.

- Shoshone National Forest Land and Resource Management Plan (USFS 2009a)
- Fremont County Land Use Plan (Fremont County 2004)
- Natrona County Development Plan (Natrona County 1998)
- Carbon County Land Use Plan (Carbon County 1998)
- Sweetwater County Comprehensive Plan (Sweetwater County 2002)
- Hot Springs County Land Use Plan (Hot Springs County 2002)
- Natrona County Conservation District Long Range Strategic Plan 2011-2015 (Natrona County Conservation District 2010)
- Popo Agie Conservation District Long Range Plan 2008-2012 (Popo Agie Conservation District 2007)
- Saratoga-Encampment-Rawlins Conservation District Long Range and Natural Resource Management Plan 2007-2011 (Saratoga-Encampment-Rawlins Conservation District 2006)
- Sweetwater County Conservation District Land and Resource Use Plan and Policy (January 2005) (Sweetwater County Conservation District 2005)
- Dubois-Crowheart Conservation District Land Use and Resource Management Plan 2011-2015 (DCCD 2010)
- Lower Wind River Conservation District Long Range Plan 2011-2015 (Lower Wind River Conservation District 2010)
- U.S. Fish and Wildlife Service Pathfinder Interim Management Plan (USFWS 2004)
- National Park Service's Comprehensive Management and Use Plans for the California, Pony Express, Oregon and Mormon Pioneer National Historic Trails (NPS 1999)
- The 2009 Continental Divide National Scenic Trail Comprehensive Plan (USFS 2009b)
- Lander Field Office Resource Management Plan (BLM 1987a)
- Pinedale Field Office Draft Resource Management Plan (BLM 2008a)
- Cody Field Office Resource Management Plan (BLM 1990)
- Grass Creek Resource Management Plan (BLM 1998)

- Washakie Resource Management Plan (BLM 1988)
- Casper Resource Management Plan (BLM 2007b)
- Rawlins Field Office Resource Management Plan (BLM 2004c)
- Green River Resource Management Plan (BLM 1997a)

Chapter 2. Resource Management Alternatives

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2.1. Resource Management Alternatives

This chapter presents four alternative resource management plans (RMPs) for managing the Lander Field Office planning area. The letters A, B, C, and D identify the four alternative plans. Alternative A, the No Action Alternative, represents the continuation of current management direction. Alternatives B and C represent the “bookends,” or the range of alternatives. The Bureau of Land Management (BLM) identified Alternative D as its Preferred Alternative in the Draft RMP and Environmental Impact Statement (EIS). Based on comments received during the public comment period on the Draft RMP and EIS, the BLM revised the Preferred Alternative. As modified, Alternative D is now presented as the Proposed RMP in the Final EIS. Each alternative provides a different approach for managing public lands and resources within the planning area, and represents a complete and reasonable land use plan that meets the purpose and need described in Chapter 1.

2.2. Summary of Changes to the Proposed RMP and Final EIS

The Draft RMP and EIS was published in September 2011, and the public comment period closed in January 2012. The BLM identified 1,685 individual comments from the comment documents received, which touched on a wide range of issues. While many of the comments strongly supported the Preferred Alternative in the Draft RMP and EIS, commenters also identified areas where the document could be improved. The Lander Field Office carefully evaluated these comments (see Appendix X (p. 1829)). The Proposed RMP and final EIS contains a number of changes made in response to comments. Before the public comment period for the Draft RMP and EIS ended, the BLM published the Notice of Intent (NOI) for the greater sage-grouse programmatic EIS. The BLM received extensive comments on that planning effort regarding management for the benefit of greater sage-grouse, and the agency also considered these comments during revision of the Draft Lander RMP and EIS. Substantive changes are identified in the document with shaded text. A summary of the key management changes follows.

Changes related to greater sage-grouse: Protections for greater sage-grouse and their habitat were incorporated to better protect sagebrush habitat for the benefit of all sagebrush-obligate species. For example, the BLM incorporated Required Design Features identified by the Sage-grouse National Technical Team (NTT) and other sources to address impacts from surface-disturbing activities. These protections will have the effect of limiting surface disturbance and habitat fragmentation, which will benefit many resources, including soil and water, vegetation, viewshed, and wildlife. For the most part, the Required Design Features were a restatement of existing management practices, such as co-location of rights-of-way (ROWs) or clustering of development infrastructure. Some of the measures recommended by the NTT, while not incorporated in the Proposed RMP and Final EIS, were analyzed under other alternatives. This type of change includes the limitation on use of prescribed fire, the requirement for full suppression of wildfire in Core Area receiving less than 12 inches of precipitation per year, and the prioritization of Core Area for rangeland health assessments and reclamation projects.

Changes of ROW management from exclusion to avoidance: A number of commenters, and particularly local and state Cooperating Agencies, stated that the exclusion areas associated with the Congressionally Designated Trails and the Greater Sage Grouse Reference and Education Area were unnecessarily restrictive, and that the resource objectives could be achieved with avoidance management and appropriate avoidance criteria. Additional analysis by the Lander Field Office confirmed that exclusion was too restrictive because it involved a complete prohibition with no

provision for exception or waiver, whereas avoidance allowed ROWs to be authorized where suitable and properly mitigated. The Proposed RMP manages approximately 411,906 fewer acres as ROW exclusion areas and approximately 321,334 more acres as ROW avoidance areas. The BLM also identified avoidance criteria in Appendix E (p. 1483).

Designation of additional ROW corridors: State and local Cooperating Agencies and industry commented that there were insufficient designated corridors, particularly for underground pipelines. The Governor of Wyoming emphasized the need to facilitate the transportation of carbon dioxide (CO₂) for enhanced oil recovery and carbon sequestration. The Lander Field Office had evaluated the demand for CO₂ transportation, which has been a BLM-authorized use for many years. However, the Governor identified future demands in other parts of Wyoming that could best be supported by pipelines through the planning area. Accordingly, 50,047 additional acres, all in areas with existing disturbance, were designated as ROW corridors.

Broadening the management focus of the Greater Sage Grouse Reference and Education Area: Commenters pointed out that management of the area from Hudson to Atlantic City, identified in the Draft RMP and EIS as emphasizing research on greater sage-grouse, is also the location of other very important values, and that sole species management direction overlooked opportunities to manage the area as a whole to protect those other values. These values include important viewsheds such as the backdrop of the Wind River foothills and the Towns of Lander, Red Canyon, and Atlantic City; important cultural values, including regional and Congressionally Designated Trails; historic mining locations in South Pass; and crucial winter range for elk, mule deer, pronghorn and moose. In addition to emphasizing multiple resource management, the commenters also noted that the management emphasis was too narrowly focused on protecting the greater sage-grouse migration corridor in the proposed Twin Creek ACEC, but overlooked development threats to other resources. The management in the Preferred Alternative was overly restrictive of ROWs, which are a discretionary action for BLM, and did not protect the area from locatable mineral entry, which is a non-discretionary action. Accordingly, the Hudson to Atlantic City area, including the Twin Creek ACEC, and the Lander Slope and Red Canyon ACECs are proposed for withdrawal from locatable mineral entry. Although all of the area is excluded for major ROWs, it is avoided for minor ROWs, which provides the multiple-use management flexibility for the BLM to protect resources but to allow use that does not have adverse impacts. This management focus is in keeping with the management already identified for the Lander Slope, Red Canyon, and South Pass ACECs, and the efforts to work with the State of Wyoming to acquire state trust lands to protect values in the area while allowing the state to acquire lands elsewhere that could be managed to provide more trust income.

Extending mule deer crucial winter range timing stipulations to mule deer winter range: The 1987 RMP protected both elk crucial winter range and winter range because of the importance of the elk herds, but did not do so for mule deer. Since 1987, elk populations have stabilized and in some places increased, but mule deer numbers are down not only in the planning area, but also across the Rocky Mountain region. Several commenters identified the need for special management for mule deer, particularly in response to increasing oil and gas development in important mule deer habitat. Subsequent to the release of the Draft RMP and EIS, the BLM received a proposed Plan of Development for a large oil and gas field in the Lysite area. The Lysite area was identified for intensive development in the Draft RMP and EIS. The Plan of Development, which will be analyzed in an EIS, identifies a larger area than had originally been projected, with increased development pressures on crucial mule deer populations. The Proposed RMP extends the same seasonal restrictions to mule deer winter habitat as crucial winter habitat.

Changes in the National Trails Management Corridor: Between publication of the Draft RMP and EIS and the preparation of the Proposed RMP and Final EIS, national guidance for units of the National Landscape Conservation System (NLCS) changed, with important alterations in the guidance for Congressionally Designated Trails. This change in guidance supported many of the public comments received regarding the boundaries of the Congressionally Designated Trails. The Preferred Alternative managed the corridor in which Congressionally Designated Trails are located as the Heritage Tourism and Recreation Corridor. The boundaries of the Heritage Tourism and Recreation Corridor were based on a 5-mile distance from the Congressionally Designated Trails farthest apart, without regard to the setting or visual resources. Within the 5-mile distance there were two different oil and gas management zones (with controlled surface use [CSU] or no surface occupancy [NSO] management). The Heritage Tourism and Recreation Corridor was excluded to major ROWs except for three designated crossings. Public comments indicated that there was a need for one additional crossing at the location where the Bison Basin Road meets Highway 287. The Proposed RMP and Final EIS incorporates the request for an additional crossing that meets strict criteria, including staying within the existing disturbance of the County Road. The National Trails Management Corridor (NTMC) was redrawn based on the setting of the Congressionally Designated Trails and their nature and purposes, as required by guidance. The overall size of the NTMC is smaller than the Heritage Tourism and Recreation Corridor, but within the NTMC, management is uniform rather than differing by zones. The NTMC is managed as an avoidance area for ROWs but, except for crossing of the actual ruts of the National Historic Trails (NHTs), ROWs may be considered that meet the NTMC nature and purposes and Visual Resource Management (VRM) objectives.

Comments submitted on the Draft RMP and EIS fell within the wide range of alternatives analyzed by the BLM. The changes made in the Proposed RMP and Final EIS prompted by the comments do not require a supplemental EIS because they do not include or raise any issues that were outside the range of the alternatives.

2.3. Alternative Development Process

To comply with National Environmental Policy Act (NEPA) requirements in the development of alternatives for this RMP and EIS, the BLM sought public input and analyzed a range of alternatives, including the No Action Alternative (Alternative A). Alternative formulation considered existing land use plan decisions and issues and concerns developed internally and solicited from the public during the scoping process. Broadly, the BLM followed five steps to develop alternatives:

1. Receive Public Input (Scoping)
2. Identify Current Management (Alternative A – No Action Alternative)
3. Develop the Range of Alternatives (alternatives B and C)
4. Analyze the Effects of the Alternatives (alternatives A, B, and C)
5. Develop the Preferred Alternative (Alternative D)

2.3.1. Receive Public Input

The BLM collected and considered public input received during the scoping process in developing the alternatives and the associated management actions. The BLM considers public input throughout the alternative development process. Chapter 5 and the project Scoping Comment Summary (available on the RMP revision website at <http://www.blm.gov/wy/st/en/programs/Planning/rmps/lander/docs.html>) summarize the results of the public scoping process and opportunities for future public involvement.

2.3.2. Identify Current Management

The 1987 Lander Field Office RMP (existing plan), is the basis for the No Action Alternative (Alternative A) also called current management. Alternative A, in conjunction with the planning criteria and the key issues identified during the scoping process, was used as a baseline for developing the range of alternatives.

2.3.3. Develop the Range of Alternatives

The BLM conducted a series of 10 alternatives development workshops with a team comprised of BLM staff and cooperating agencies. During the initial workshop, the team shared their knowledge and expertise and collaborated to identify goals and objectives for each resource. Each subsequent workshop refined the management composing each alternative and narrowed the scope of alternatives to a reasonable range, limited by the planning criteria (refer to Chapter 1, Planning Criteria). Table 2.1, “Alternatives Development Workshops” (p. 18) identifies the dates and focus of each workshop. Prior to each workshop, the BLM provided preliminary draft alternatives prepared by BLM specialists to the cooperating agencies for each resource to be discussed during the workshop. These preliminary alternatives served as a starting point for alternative formulation and a basis for discussion by team members during the workshops.

Table 2.1. Alternatives Development Workshops

Workshop Number	Dates	Focus
1	March 18 – 20, 2008	Goals and Objectives
2	May 21 – 23, 2008	Range of Alternatives
3	June 18 – 20, 2008	Range of Alternatives
4	August 20 – 21, 2008	Range of Alternatives
5	September 24 – 25, 2008	Range of Alternatives
6	December 3 – 5, 2008	Range of Alternatives
7	January 21 – 23, 2009	Range of Alternatives
8	February 18 – 20, 2009	Range of Alternatives
9	December 9, 2009	Range of Alternatives
10	May 12 – 14, 2010	Preferred Alternative

The team formulated a range of alternatives (alternatives B and C) to meet the purpose and need of this RMP and EIS using different approaches to resource use. The Preferred Alternative was subsequently developed based upon the range identified at the meetings.

Management actions developed under all alternatives are subject to valid existing rights. In addition, management actions may only be implemented when consistent with applicable laws, regulations, and policies. The BLM considered, but did not carry forward for detailed analysis,

alternatives that did not meet the planning criteria or the purpose and need (see Chapter 1), or were already part of an existing plan, policy, requirement, or administrative function that would continue under the revised RMP.

2.3.4. Analyze the Effects of the Alternatives

The fourth step in the alternatives development process involved analyzing the effects of the range of alternatives. This task involved analyzing the impacts of one set of resource management actions on other resources and resource uses. The BLM compiled these data into Chapter 4 and considered them in step five.

2.3.5. Develop the Preferred Alternative

The BLM developed Alternative D, the Preferred Alternative, by considering the impacts analysis (Chapter 4) for alternatives A through C; knowledge of specific issues raised throughout the planning process; planning criteria; and recommendations from cooperating agencies, BLM specialists, and resource experts.

The BLM presented the Preferred Alternative to the team during the Preferred Alternative workshop. Refer to Table 2.1, “Alternatives Development Workshops” (p. 18) for the date of the Preferred Alternative workshop. The BLM refined the Preferred Alternative using the following selection criteria:

- Reflects what the BLM believes to be the best combination of decisions to achieve its goals and policies
- Represents the best solution to the purpose and need as described in Chapter 1
- Provides the best approach to address key planning issues
- Considers cooperating agencies, public scoping comments, and BLM specialists’ recommendations

The BLM presented the Preferred Alternative (Alternative D) in the Draft RMP and EIS for public comment. Based on comments received during the public comment period on the Draft RMP and EIS, the BLM revised the Preferred Alternative. As modified, Alternative D is now presented as the Proposed RMP in the Final EIS. Following resolution of protests and the Governor’s consistency review, the BLM will prepare a Record of Decision (ROD) and Approved RMP.

2.4. Alternative Components

Each alternative comprises two categories of land use planning decisions: (1) goals and objectives and (2) allowable uses and management actions.

2.4.1. Goals and Objectives

Goals and objectives direct BLM actions to most effectively meet legal mandates, regulations, agency policy, as well as local and regional resource needs. Goals are broad statements of desired outcomes that are usually not quantifiable. The BLM has developed Land Health Standards applicable to all ecosystems and management actions that are typically included as goals in land use plans. Objectives identify specific desired outcomes for resources. Objectives are usually quantifiable and measurable and may have established timeframes for achievement.

When quantified, the indicators associated with Land Health Standards are a possible source of objectives in land use plans. The Detailed Alternative Descriptions by Resource section (Section 2.7 (p. 72)) of this chapter describes the management goals and objectives for each resource.

2.4.2. Allowable Uses and Management Actions

The BLM developed allowable uses and management actions to achieve the goals and objectives defined for each resource.

2.4.2.1. Allowable Uses

Allowable uses are a category of land use decisions that identify where specific land uses are allowed, restricted, or excluded on BLM-administered lands and federal mineral estate in the planning area. Alternatives may include specific land use restrictions to meet goals and objectives and can exclude certain land uses (e.g., mineral leasing, recreation, utility corridors, and livestock grazing) to preserve resource values. For example, alternatives considered in this RMP revision restrict surface-disturbing activities from oil and gas development within certain occupied greater sage-grouse leks and the associated buffers. Allowable uses often contain a spatial component to identify the management prescription for particular geographic areas. Maps of the planning area in Appendix B (p. 1445) illustrate these spatial components and define the geographical extent of the management actions. The maps are for illustrative purposes only and might not accurately reflect all decisions due to the size of the resource area; details can be obscured or not readily apparent, or the size could appear larger on the maps so that the feature stands out when depicted on such a broad scale. The management actions that make up the Proposed RMP are in all cases the decision and not modified by the manner in which the decision is displayed on the maps.

2.4.2.2. Management Actions

Management actions are proactive measures (e.g., measures the BLM will pursue to enhance watershed function and condition), or limitations intended to guide BLM activities in the planning area. An example of this type of management action is to manage forests and woodlands to improve vegetation health and for the benefit of other resources using natural processes to the greatest extent possible.

2.4.2.3. Organization of Allowable Uses and Management Actions in the Alternatives

For simplicity, the remainder of this chapter uses the term “management action” to include both allowable uses and management actions. Therefore, when text refers to management actions, it includes both categories. The alternatives include two types of management actions. *Management actions common to all alternatives*, apply regardless of the alternative. *Management actions by alternative*, represent the range of land use management decisions considered across alternatives. These management actions vary among the alternatives and represent a range of management options the BLM considered to meet the stated goals and objectives and the purpose and need for the RMP revision.

2.5. Alternatives Considered but Not Carried Forward for Detailed Analysis

The BLM considered several alternatives and management options as possible methods for resolving resource management issues and conflicts, but after further review and consideration, did not carry several of those forward for detailed analysis. This section describes these alternatives and options. Reasons for not carrying these alternatives/options forward include: (1) they would not fulfill requirements of the Federal Land Policy and Management Act (FLPMA) or other existing laws or regulations; (2) they would not meet the purpose and need; (3) they were already part of an existing plan, policy, or administrative function; or (4) they did not fall within the limits of the planning criteria.

2.5.1. Require a Plan of Operations for the Entire Field Office

The BLM considered an alternative that would have required a mining Plan of Operations for all locatable mineral activities in the planning area. The requirement for when a Plan of Operations for locatable minerals is needed is determined by federal regulation (43 Code of Federal Regulations [CFR] 3809 et seq.) and is not an RMP decision. Accordingly, the proposed alternative is unreasonable because it is inconsistent with basic policy and regulation.

To the extent that this is a request that the entire planning area be evaluated as an Area of Critical Environmental Concern (ACEC), which is the only RMP decision that would require a Plan of Operations that could be applied to all BLM-administered lands, this alternative would not meet the purpose and need for the EIS and would prevent other reasonable uses. In any event, the proposal does not identify relevant and important values that are more than regionally important or that require special management. To the extent that this is a request for an ACEC for all occupied greater sage-grouse habitat, this is addressed in Section 2.7, “Greater Sage-Grouse Management” (p. 34).

2.5.2. Close Abandoned Mine Land Reclaimed Areas to New Surface Disturbance

A citizen proposal suggested that lands that had been reclaimed under the Abandoned Mine Land program, which the BLM operates in conjunction with the State of Wyoming, be closed to new surface disturbance. The proposal was intended to protect the investment in reclamation that had been made with public funds. The BLM considered prohibiting additional surface disturbance on these lands both to protect the investment already made in reclamation and to help to ensure that the reclamation continued to improve. However, the BLM determined that the decision to allow or not allow new development should be made on a site-specific basis. In some cases, disturbance might not be appropriate, such as where health and safety issues exist because of prior use. A total prohibition was determined to be unreasonable and not to meet the purpose and need of the RMP because it could prevent reasonable multiple use and because the goals of the proposed alternative could be achieved through other means. For example, any new development would be required to meet reclamation standards, something that was not required at the time the original mines were abandoned. Moreover, there are situations where it is less destructive to the ecosystem as a whole to disturb soils in the process of being reclaimed than historically undisturbed areas. This determination must be made on a site-specific basis. The BLM lacks data

or information to support a planning area-wide closure; an alternative considering a closure would be arbitrary and without scientific basis.

2.5.3. Prohibit Oil and Gas Development

A citizen proposal suggested closing all of the planning area to oil and gas development because of important resources such as greater sage-grouse habitat, crucial winter range, and visual resources. The BLM determined that a planning area-wide closure was not in conformance with policy and regulations. Oil and gas development is an authorized use of BLM-administered lands and encouraged by national energy policy. Therefore, it would be arbitrary and inconsistent with existing laws to analyze closing the entire planning area to development. Moreover, that analysis would be misleading since extensive valid lease rights exist that could be developed regardless of changes in management in this RMP revision. The alternatives analyzed include modifications to the approach under Alternative A, in which most of the planning area is open to oil and gas development, with small areas having a NSO restriction. In addition, the alternatives analyzed include modifications of oil and gas development:

- Alternative B closes many areas with resource and use conflicts including approximately 2.4 million acres with only 187,524 acres open to leasing.
- Alternative B has more areas with either NSO restrictions or CSU stipulations, particularly in the vicinity of Congressionally Designated Trails.
- Alternative B analyzes closing all greater sage-grouse Core Area to oil and gas leasing. Approximately 1 percent of the planning area does not contain greater sage-grouse habitat; 29 percent contains general habitat, and 70 percent contains priority greater sage-grouse habitat or Core Area. This action translates to the closure of 70 percent of BLM-administered surface to oil and gas leasing.

A subset of this proposed alternative is to close all occupied greater sage-grouse habitat to oil and gas leasing. Only 1 percent of the planning area is outside greater sage-grouse habitat. Such closure would not be consistent with national energy policy and would, similarly, not meet the purpose and need for this RMP revision.

2.5.4. Identify Oil and Gas Lease Parcels to be Offered Instead of Responding to Industry Requests and Utilize Master Leasing Plans

Several proposals suggested that the BLM identify which parcels would be offered for oil and gas leasing rather than responding to industry nominations. The BLM determined that this alternative is not an RMP level decision. The BLM addresses the issue raised by the approach – that the BLM focus development in areas with low resource conflict – through alternatives that open or close an area to leasing or impose lease restrictions (e.g., CSU or NSO stipulations or timing limitations). In addition, the existing alternatives identify different ways to protect resources while allowing resource use.

Subsequent to the start of the RMP revision process, the BLM issued guidance regarding Master Leasing Plans (MLPs) to address oil and gas leasing in areas with resource values of concern; see Instruction Memorandum (IM) 2010–117. The BLM received nominations for five areas in the planning area (either in whole or in part) for which MLPs were requested. BLM guidance requires land use plan revisions to analyze MLP proposals.

The Wyoming State Office evaluated the proposals for MLPs in the planning area. Two areas were determined to be appropriate for analysis under the MLP concept. The other three areas did not meet the criteria identified in IM 2010–117 because of low development potential or because much of the area is already leased. The Wind River Hydrologic Basin contains areas with moderate to high potential. However, the lands with this potential are substantially leased (Map 33). In addition, other management such as greater sage-grouse protections would achieve similar protection objectives as would be identified in an MLP analysis. The three areas determined not appropriate for analysis under an MLP include:

Sweetwater/South Pass: The nominated portion in the planning area is entirely within an area analyzed under Alternative B as closed to leasing and as an ACEC that is open to oil and gas leasing subject to NSO stipulations under Alternative D. The BLM analyzed other protections for resource values under the alternatives through limitations on surface disturbance and the requirement of a Plan of Operation. BLM determined that these alternatives analyze the types of protections that would be provided for under an MLP analysis.

Green Mountain/Ferris Mountain: The Wyoming State Office determined that the portion of the proposed MLP area in the Green Mountain/Ferris Mountain area of the planning area was within the existing Green Mountain ACEC. Alternative B analyzes closing the entire nominated area to oil and gas leasing, and Alternative D analyzes managing a larger area than the existing ACEC as open to oil and gas leasing subject to NSO stipulations. The southern part of the nominated area that is not part of the ACEC in Alternative D is already leased; IM 2010–117 applies to areas where a substantial portion is not leased. The BLM determined that because the ACEC management would afford the same kind of protections that would be a part of an MLP analysis, the effect of resource protective management through an MLP approach was fully considered.

However, in evaluating the Green Mountain/Ferris Mountain proposal, areas to the south of the ACEC were identified as highly visible with steep slopes that are not suitable for oil and gas surface operations. Accordingly, this area will be open for oil and gas leasing subject to an NSO stipulation under Alternative D. These acres were not included in the Impact Analysis for Planning Model (IMPLAN) analysis of lands open to oil and gas development with major constraints. However, some of this area has overlapping wildlife timing limitations, which would be a major constraint. In addition, the economic impacts associated with this management were not considered to be sufficiently great to reduce the utility of IMPLAN data as a tool to compare alternatives, particularly in light of the relatively small difference in impacts between Alternative B (which is more restrictive than Alternative D) and Alternative C (which is less restrictive than Alternative D). The NSO management is analyzed under Alternative D in Chapter 4.

The Wind River Hydrologic Basin: The proposal to prepare an MLP analysis for the entire Bighorn Basin drainage (which includes the Wind River hydrologic basin) includes a vast area, covering approximately two-thirds of the planning area, and incorporates vastly different resources, including areas that are already substantially leased and areas with little to no mineral potential. This type of “broad stroke” oil and gas management approach is suitable at an RMP level, and not the finer, site-specific planning scale that the MLP approach is designed to achieve. Since such a large scale proposal does not meet MLP guidance, it is not further analyzed.

The two parcels identified for MLPs that the statewide evaluation determined should be analyzed were the Dubois Area and Beaver Rim:

Dubois: The proposal identified many resource values in the Dubois Area, some of which were identified for special management in the 1987 RMP including the East Fork, Whiskey Mountain, and Dubois Badlands ACEC, and the Whiskey Mountain and Dubois Badlands Wilderness Study Areas (WSAs). These areas are managed as open to oil and gas leasing subject to an NSO stipulation. Dubois has high value wildlife resources including three species listed under the Endangered Species Act (ESA): the gray wolf, grizzly bear, and Canada lynx. In addition, Dubois is home to the largest wintering elk herd outside of elk feeding grounds and to the nationally famous bighorn sheep herd in the Whiskey Mountain area. However, the use of an MLP analysis for Dubois was not carried forward for detailed analysis because two alternatives (B and D) manage the entire Dubois Area as closed to leasing. Alternative C manages oil and gas as open subject to standard stipulations, and current management under Alternative A does not include an MLP analysis. As such, protections provided by an MLP are within the range of alternatives already analyzed. The analysis showed that an MLP that allowed leasing under any terms would not meet the resource protections the BLM identified as being required due to the unique resources in the Dubois area. An MLP analysis presumes that leasing would occur and offers additional site-specific resource protections. These lease stipulations would be unnecessary if the entire area is closed to leasing. If at a later date, the BLM made a decision that leasing was appropriate, then a detailed analysis under an MLP would be appropriate. The BLM considered including an MLP analysis area under Alternative C (the resource utilization alternative), but determined that this management did not meet the assumptions for Alternative C management and that maximum utilization under standard lease stipulations would be analyzed.

Beaver Rim: Application of an MLP in the Beaver Rim area is analyzed in detail under Alternative D in Chapter 4. The initial citizens' proposal did not include a map of the proposed MLP area. After preliminary mapping efforts and further input from the citizens' proposal group, the BLM refined the boundary of the Beaver Rim MLP area to the area displayed on Map 135. The Beaver Rim MLP area is further described in the *Leasable Minerals – Oil and Gas* section in Chapter 3.

2.5.5. Defer Oil and Gas Leasing until Infrastructure is in Place to Ensure Price Parity with Other Parts of the Country

The price of natural gas produced in Wyoming is generally lower than gas produced in other locations, which is often attributed to a lack of infrastructure such as pipelines to take the product out of Wyoming. Consequently, there is less competition for Wyoming-produced gas and therefore a lower price is paid. This results in lower revenues to the United States as well as to the State of Wyoming and local governments. A proposed alternative was to defer additional leasing until additional infrastructure is in place in order to increase the competition for Wyoming-produced natural gas and thus increase the economic benefit from oil and gas leasing. The BLM determined that this approach would inappropriately involve the BLM in industry financial decisions. Although the prices of oil and natural gas determine the financial contribution of oil and gas production to Wyoming state and county budgets, lower prices in Wyoming may be more beneficial to the country as a whole. Accordingly, the proposal was not analyzed in further detail because the maximization of tax payments associated with oil and gas pricing was not within the purpose and need for the RMP revision identified in Chapter 1.

2.5.6. Evaluate Oil Shale-Tar Sands Production

The very southern portion of the planning area has potential for oil shale-tar sands or other unconventional oil and gas production (BLM 2009b). However, the potential is not high. The areas are remote from existing oil and gas transportation facilities and have very limited water, a requirement for oil shale-tar sands production. Consequently, the BLM determined that the likelihood for commercially viable oil shale-tar sands production was too remote and speculative to support analysis. Should oil shale-tar sands production become viable in the future, an EIS would determine if such an action is in compliance with the RMP's goals and objectives and whether the RMP would need to be amended. Accordingly, BLM determined that analyzing oil shale-tar sands was not reasonable.

2.5.7. Consolidate All Wild Horse Herd Management Areas in the Green Mountain Common Allotment

The BLM considered if there would be resource benefits to consolidating all seven wild horse Herd Management Areas (HMAs) into one management area in the livestock grazing allotment called the Green Mountain Common Allotment in lieu of the sheep and cattle that currently utilize the allotment (along with one HMA). The BLM determined that there were not sufficient data to make analysis of this alternative feasible. Not enough is known about the benefits of mixing herds with separate genetic ties, some of which are more typical of the mustangs descended from Spanish horses. The BLM does not fully understand the herd structures and what moving the herds would do while still allowing them to be free-roaming. Although identifying an HMA is a land use planning decision, there has been no public support for changing the use of the Green Mountain allotment to wild horses only and substantial opposition to any use of the area by wild horses. Wild horse management is in flux and is being addressed nationally in response to growing herd numbers and conflicts among all public land users. It might be necessary to consider a change in HMAs in response to national direction.

Regarding allocating all forage to wild horses by closing the allotment to livestock grazing, the BLM determined that there were not sufficient resource conflicts to warrant this decision.

2.5.8. Open or Close the Planning Area to Solar Energy Generation

Solar energy generation is authorized by the BLM through ROW grants. The BLM, through land use planning decisions, determines if areas will be open or excluded to solar energy generation ROWs. The BLM determined that the potential for industrial-level solar energy generation in the planning area is low (BLM and DOE 2003) and Wyoming is not included in the study area for the Final Solar Energy Development Programmatic EIS (BLM and DOE 2012). Therefore, specific industrial-level solar energy ROW avoidance and exclusion areas are not analyzed. However, should an industrial solar energy ROW application be received it would be subject to the ROW avoidance and exclusion areas within the selected alternative and would undergo the appropriate environmental analyses. The BLM determined that analysis of solar-energy specific avoidance and exclusion areas was not reasonable and speculative without more information regarding demand and potential. Small, individual solar-energy projects such as are associated with small water wells can be addressed on a site-specific basis.

2.5.9. Close the Lander Slope and Dubois Section 15 Leases to Livestock Grazing

Several citizen proposals identified an alternative that closes Section 15 leases to livestock grazing. (See Chapter 3 for a discussion of the two types of grazing allotments; Section 15 leases are generally small allotments, with more intermingled private lands. The Section 3 leases are on the Lander Slope and in Dubois.) Although closing these leases to livestock grazing would be less arbitrary than closing bigger sections to livestock grazing because the leases involve a smaller area, the data for these allotments still need to be collected as part of rangeland health assessments. The BLM does not have data showing that resource conflicts in these areas can be resolved only by closing them to public land grazing. Moreover, because of the intermingling of private lands, each allotment needs to be evaluated to determine the extent to which additional fencing would be required in order to enforce a grazing closure. The Lander Slope and Dubois areas are very important wildlife habitat (see Chapter 3) and the need for fencing could have far more adverse impacts than the speculative beneficial impacts of removing livestock grazing use. The BLM determined that the issue for closing the Section 15 leases would be based on speculation and not data if achieved at the RMP level and thus would be arbitrary to analyze.

2.5.10. Require Planning Area Wide Phased Development

An alternative was suggested to require planning area-wide “phased development” as an approach to prevent the “boom-bust” aspect of intensive development and to limit additional disturbance until adequate reclamation has been achieved. The BLM determined that the appropriate scale for addressing economic issues and disturbance associated with major development was on a project specific basis. The RMP makes a decision where development may or may not occur by opening or closing areas to mineral and realty development. Other limits such as lease stipulations help on a site-specific basis to limit the potential adverse impacts that may result from major development. However, the market determines when demand for that development will occur and the actual sites for the development. Accordingly, the pace of development can be identified only on a site-specific basis. Adequate NEPA analysis requires that economic and cultural impacts (both direct and cumulative) be analyzed before a particular project is authorized. The same is true for reclamation. The issues raised by this alternative are addressed in Table 2.52, “8000 Socioeconomic Resources (SR) and Health and Safety” (p. 248). Analysis of these impacts across the planning area through the RMP revision process would be speculative and arbitrary.

2.5.11. Manage the Beaver Creek Ski Area as a Special Management Area

The BLM received a citizen proposal to manage the Beaver Creek Ski Area with special management. The type of management was not identified in the proposal. The BLM agrees that the area is appropriate for individual management and, in accordance with extensive scoping and travel management comments, that analysis of the management of the area as a distinct Extensive Recreation Management Area (ERMA) was appropriate.

2.5.12. Manage Highway 287 as a Scenic Byway

Public comment suggested managing Highway 287 as a BLM Scenic Byway, a part of the National Scenic Byway System, and a RMP revision is an appropriate time for making this management decision (BLM 2005b). Generally, this determination is made in conjunction with state designation: “Byways must be identified, designated, planned, developed, and managed within the framework of State programs” (BLM 1993a). The State of Wyoming maintains a program to designate highways as scenic byways called the Wyoming Scenic Byway and Backway Program (Wyoming Department of Transportation 2009). An important consideration for the State of Wyoming in designating a highway is whether it has strong local support including support of adjoining private property owners (Wyoming Department of Transportation 2009). The BLM has not received any indication that this proposal has strong local support; the proposal was not accompanied by any information regarding the interest of the public in establishing this management.

Accordingly, none of the alternatives analyze this management. However, two of the alternatives would manage the lands within the viewshed of Highway 287 to protect its scenic character and its important contributions to the historical setting of the NHTs; see Map 125 and Map 127 which show the protections in the area around Highway 287. Although this management does not have the same effect as byway designation in terms of financial benefits, these alternatives preserve the setting should local support develop.

2.5.13. Manage the Sweetwater River Corridor as a High Priority Management Area

Public comments suggested that the Sweetwater River corridor (which the BLM understood to mean the lands within the watershed of the Sweetwater River) should be managed as a separate, high priority area for resource protection. The BLM analyzed a similar but somewhat different approach to protecting the area’s specific resources. The watershed of the Sweetwater River includes the route followed by the Congressionally Designated Trails, which themselves requires management in accordance with BLM Manuals 6250 and 6280 (BLM 2012b and BLM 2012c). Specifically, to the greatest extent possible, the BLM shall manage Congressionally Designated Trails so as to safeguard the nature and purposes of the trails, and in a manner that protects the values for which the components of the trail systems were designated, recognizing the nationally significant scenic, historic, cultural, recreation, natural, and other landscape values (hereinafter referred to as resources, qualities, values, and associated settings) of the public land areas through which such Congressionally Designated Trails may pass, and the primary trail use or uses. Alternatives B would manage the viewshed along the Sweetwater River as a Heritage and Recreation Corridor to protect the viewshed from the Congressionally Designated Trails. Alternative D would manage this area as the NTMC. These protections achieve the same result as protecting the Sweetwater River corridor resources only and therefore would have substantially similar impacts.

The commenters did not identify specific management prescriptions they wished to see applied to the Sweetwater River watershed. However, management of the NTMC provides increased protection for a number of resources, including the Congressionally Designated Trails and their settings, wildlife values including greater sage-grouse, and recreational use.

Certain comments suggested that the RMP analyze closing the area to livestock grazing or substantially reducing grazing. Land health assessments in this area are high priority, so livestock grazing management will be analyzed as soon as the assessments are completed. The BLM completed rangeland health assessments for the Green Mountain Common Allotment, which contains most of the Sweetwater River watershed in the planning area, and completed an Environmental Assessment in 2011 analyzing grazing (including a no action alternative) for this 500,000-acre allotment.

2.5.14. Designate Areas as “Open” to Facilitate Motorized Vehicle Play Areas

Numerous members of the public commented on the need for an area where motorized vehicle use is not restricted to roads and trails; thus allowing for a motorized vehicle “play area.” In areas designated as “open” intensive motorized vehicle travel is permitted year-long anywhere within the designated area.

Travel and Transportation Management guidance and 43 CFR 8340.05 have restricted the use of this designation to: “...areas where there are no special restrictions or where there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross country travel...” The Lander Field Office could not locate an area on public lands that met the above criteria. Some factors that precluded this designation included: $\frac{3}{4}$ of the field office being located in the Wyoming Governor's greater sage-grouse Core Area, other large areas of critical wildlife habitat (winter and parturition habitat), a multitude of areas where an open designation would cause user conflicts (nonmotorized recreation areas) and public safety issues (near communities), as well as areas with existing safety hazards (hydrogen sulfide gas, mine shafts).

Many comments also requested that WSAs be designated as open to motorized vehicle use. Several other comments recommended building new roads into WSAs or allowing travel on all existing roads in WSAs. Various handbooks and policies, including BLM Manual 6330, *Management of Wilderness Study Areas*, which implements the non-impairment standard contained in Section 603 of FLPMA, do not allow for these decisions in WSAs. The following is from the Land Use Planning Handbook (1601–1):

At a minimum, the travel management area designation for wilderness study areas (WSAs) must be limited to ways and trails existing at the time the area became a WSA. Open areas within WSAs are appropriate only for sand dune or snow areas designated as such prior to October 21, 1976.

To address the demand for a motorized vehicle play area the BLM analyzed leasing or selling BLM-administered lands to an entity willing to provide and manage a play area for motorized vehicles. Two areas are identified in the recreation alternatives for this purpose: (1) The Coalmine Draw Area near the communities of Hudson, Lander, and Riverton and (2) an area located near the rifle range adjacent to the community of Dubois. In addition, regardless of the alternative proposed in the document ample opportunity for motorized users will be available on existing and designated roads across the majority of the Lander Field Office.

2.6. Livestock Grazing Analysis

2.6.1. Introduction

The Lander RMP emphasizes a broad range of forage allocated to livestock grazing. In August 2012, the Land Use Planning Handbook livestock grazing planning requirements were clarified by Washington Office (WO) IM 2012-169. Both WO IM 2012-169 and the Handbook support analyzing a range of forage allocation. As discussed below, the BLM analyzed closing some allotments to grazing but the number of acres is relatively small. The RMP's range of reasonable grazing alternatives is based on the amount of forage allocated to livestock grazing.

Forage is measured in animal unit months (AUMs), some percentage of which is allocated to livestock and to other grazing animals such as big game; see Holechek et al. 2011. The percentage allocated to livestock is often referred to as a harvest coefficient based on the growth requirements of the plant species necessary to maintain healthy sustainable vegetative communities as well as to account for wildlife forage and habitat requirements (density and cover). Grazing permits may express the forage allocation objectives as a forage-utilization percentage. "Light utilization" is defined as 21 to 40 percent and "moderate utilization" is 41 to 60 percent. Forage may also be expressed as AUMs or the amount of forage needed to sustain a cow and calf for one month. A higher number of AUMs results in a higher livestock utilization percentage.

Early in the RMP planning process for grazing, an interdisciplinary team reviewed the planning area considering range condition, other resource values such as greater sage-grouse habitat, big game crucial winter range, wild horse populations, existing infrastructure, the categorization of the allotments as "I" or improve, "C" or custodial, and "M" or maintain and other factors. The members of the interdisciplinary team all had extensive experience in the Lander area ranging from 10 years to over 30 years resulting in a comprehensive knowledge of the planning area allotments.

The team concluded that grazing utilization under the 1987 RMP (Alternative A) was at the higher end of the 41 to 60 percent range. This utilization averaged 205,000 AUMs billed annually for the 20 years preceding the analysis. The team determined that a reasonable alternative should consider fewer AUMs allocated to livestock based on light utilization in those areas preferred by livestock (based on factors such as distance to water and slope). Theoretically, if the average actual use of 205,000 AUMs equaled 60 percent utilization, the 21-40 percent utilization should be something less than 136,800 AUMs (205,000 AUMs at 60 percent utilization suggests a total available forage of 342,000 AUMs; 40 percent of 342,000 is 136,800).

To verify this theoretical calculation, the team used geographic information system (GIS) analysis to determine reasonably foreseeable AUMs based on a version of Holechek's stocking rate analysis. The interdisciplinary team estimated forage production using the Natural Resources Conservation Service (NRCS) guidelines for ecological sites based on most of the planning area being in a mid to late seral state of succession. The GIS model first allocated forage using a harvest coefficient of 25 percent, i.e., 25 percent of forage produced is available to livestock. (Recent science suggests that 50 percent, which is conventionally used, is only adequate to support requirements of specific plant species, whereas 25 percent accounts for trampling and other uses of that forage.) The interdisciplinary team then applied reductions based on riparian-wetland habitat, greater sage-grouse priority habitat, big game crucial winter range, distance to water and slope. Reductions because of wild horse management areas were considered but eliminated for

reasons described below. The reductions are identified in Table 2.2, “Reductions to Animal Unit Months” (p. 30).

Table 2.2. Reductions to Animal Unit Months

Factor	Reductions
Greater than 2 miles from water	Excluded from calculation of available forage
Slope: 11-30 percent	Forage reduction of 30 percent
Slope: 31-60 percent	Forage reduction of 60 percent
Slope greater than 60 percent	Excluded from calculation of available forage
Greater sage-grouse priority habitat	Forage reduction of 10 percent
Big game crucial winter habitat	Forage reduction of 5 percent
Riparian-wetland areas	Forage reduction of 60 percent

The resulting analysis identified a total forage allocation of approximately 129,000 AUMs, or a reduction of approximately 63 percent from historical actual use. These reductions were anticipated to result in light forage utilization and are below the 136,800 AUMs theoretically predicted for 40 percent utilization.

2.6.2. Implementation

The planning decision in Alternative B would be a light utilization standard for all allotments without regard to range condition so as to allocate more forage for wildlife and to provide cover. This is in keeping with the resource protection theme of Alternative B. If BLM workload were not a limiting feature, the light utilization could be applied to all allotments at any time even those meeting rangeland health standards, since BLM can adjust grazing permits to meet the land use plan. (There are grazing regulations for how this process is conducted which under any circumstances, cannot be done without consultation with the permittees and the State of Wyoming.) With limited BLM staff, the reasonable approach to implementing the light-utilization decision would be applied at the first time a change in the permit were needed such as a request for a range project or while fully processing a permit renewal. If an allotment were determined to not meet rangeland health standards it is likely that the AUM reductions to achieve light utilization would have additional grazing management changes such as season of use, and modifications to grazing strategies (rotations, herding, etc.) because fencing and water development would not be used. The GIS analysis predicted that Alternative B would result in some 129,000 AUMs being reduced over time. During implementation on a case-by-case basis, however, it is likely that the AUMs would be reduced below 129,000 because of other Alternative B management such as closing allotments for forage reserves, voluntary relinquishment of allotments, and extended periods of non-use.

Alternative B management for resources other than grazing would likely reduce AUMs even more. For example, Alternative B manages vegetation communities for the benefit of biological diversity including wildlife, fish, and special status species rather than for livestock grazing, thus naturally reducing the forage for grazing (such as emphasizing non-grass vegetation that is not palatable to livestock). Protections for big game are incorporated that would likely have the effect of reducing livestock grazing.

The economic analysis of Alternative B assumed that the 129,000 AUM reduction would occur at 5 percent per year over the 20 year planning cycle. However, it is likely that the reductions would be heavier in the beginning of implementation of the plan since rangeland health assessments (done in blocks as described in Chapter 3) are prioritized based on degraded riparian-wetland

condition and greater sage-grouse priority habitat. (A comparison of the riparian-wetland areas not meeting Proper Functioning Condition (PFC) as displayed on Map 48 with greater sage-grouse priority habitat on Map 65, shows that addressing the two habitat issues together is efficient.)

The block approach to standards assessments followed by fully processing permits with NEPA analysis (as opposed to renewing expiring permits under the Budget Rider without change) will ensure that over time, the lighter forage utilization would be applied to all allotments in the planning area.

The implementation of the RMP forage allocation decision is comparable to other areas requiring implementation. The RMP decision identifying the local sites Johnny-Behind-the Rocks and the Sinks Canyon Climbing Area for nonmotorized travel, for example, would be implemented after the ROD during travel management planning. The light forage utilization decision would be implemented by adjusting permits whether during permit renewal, resource conflicts, or as staffing allows to make the permit conform to the land use plan following grazing regulations.

2.6.3. Areas Open and Closed to Livestock Grazing

Although the emphasis of the grazing alternatives was a range of forage allocated to livestock, the interdisciplinary team also looked at the 70,000 acres that were closed to livestock grazing in 1987. (Five of the interdisciplinary team members had participated in that planning effort.) Some of these acres were unsuitable for livestock grazing because of terrain considerations such as granite outcroppings which do not support vegetation or areas with important wildlife values. The team determined that the basis for the original closure to livestock grazing had not changed and should not be analyzed by any alternative.

The interdisciplinary team then determined that an additional 13,000 acres of lands had conflicts with livestock grazing that might require grazing closures to resolve. These were conflicts with wildlife habitat in the Dubois area and recreational use in the Sweetwater Canyon pasture of the Silver Creek allotment. While other resource concerns were identified, the interdisciplinary team determined that the conflict could be addressed through a change in grazing management after a more detailed analysis associated with rangeland health assessments and permit renewal, rather than closing the area to livestock grazing in the RMP.

The interdisciplinary team considered other values that were later identified in IM 2012-169.

- **NHTs:** The team determined that conflict between the NHTs and grazing was a result of range infrastructure that introduces a modern element into the NHTs' setting and also concentrates cattle so that large areas become denuded of vegetation. The random sighting of one or more cows was considered not to be a conflict, because livestock were part of the emigrant experience.
- **WSAs:** The interim guidance (since revised) allows livestock grazing without additional infrastructure within WSAs. However, the majority of the acreage located within WSAs has been identified as closed to grazing based on conflicts with other resource values or lack of forage production.
- **Wild and Scenic Rivers (WSRs):** Nine segments have been determined to be eligible. Due to terrain and the difficulty of closure to livestock grazing without fencing (fencing is not permitted in Alternative B), closing the lands surrounding these segments was not analyzed.
- **ACECs:**

- Lander Slope and Red Canyon: Neither ACEC had livestock grazing conflicts which adversely impacted the ACECs' wildlife and viewsheds. Most of the Red Canyon is managed under the Red Canyon allotment management plan which addressed the vegetation and riparian-wetland impacts from grazing. Grazing did not conflict with the visual resources of the ACECs. Wildlife populations were at or above the Wyoming Game and Fish Department's (WGFD's) herd objectives. Closing the ACECs would also require fencing the extensive intermingled private lands in order to avoid livestock trespass on the public lands. New fences would impede movement of wildlife and wildlife use of the private lands, an important source of winter forage. Accordingly, the team determined that it was not reasonable to further analyze closing these allotments to grazing.
- Beaver Rim: Only new range infrastructure presented a conflict with the ACEC's visual resources; the team did not identify grazing itself as a conflict.
- Green Mountain: Because of terrain and heavily forested areas, there is limited livestock use of the ACEC. The elk numbers in the ACEC are above herd objectives indicating that there is no conflict between the elk (the relevant and important value of the ACEC) and grazing.
- South Pass Historical Landscape: Livestock were a part of the historic landscape; the identified conflict was the use of range infrastructure. Overuse of vegetation that could, over time, be detrimental to the setting could be addressed by stocking numbers and season, based upon rangeland health assessments. These assessments had not been completed as of the date of the Final EIS.
- The interdisciplinary team evaluated the wild horse herd areas which were above appropriate management level. The team, which included two wild horse specialists, determined that continued use of gathers and the administration of birth control would be necessary to control populations, establishing that wild horses had not been limited by forage competition from livestock grazing in HMAs.

2.6.4. Other Potential Grazing Conflicts Considered but Not Analyzed

Conflicts between livestock grazing and valid existing rights such as mining claims are resolved by reducing AUMs based on the acres made unavailable during mining operations; this does not require a grazing closure. Moreover, with rare exceptions, mining disturbance must be reclaimed to native vegetation. In addition, the existence of a valid right does not guarantee that the area will be developed (most mining claims are not). The interdisciplinary team determined the loss of vegetation associated with valid rights could only be addressed in a site-specific analysis based on an approved plan of development which would analyze the loss of forage. The team also considered grazing conflicts where industrial style development was emphasized. Oil and gas wells, for example, typically have 40-acre spacing. Even considering roads and well pads, which the Lander Field Office estimates as averaging 4-6 acres per well, that development leaves substantial acres where the grazing is not impacted.

WO IM 2012-169 identifies a potential conflict with solar energy; there are no industrial-scale solar energy projects identified in the Lander planning area. Should a proposal be received, an RMP amendment would be required prior to approval which would address any grazing conflict. There is no conflict between wind-energy development and livestock grazing; wind energy may make ranch operations more economically sustainable. In any event, the likelihood of wind energy being developed in the planning area is extremely low (forecast to be 50 turbines over the next 20 years), so conflicts with grazing did not arise as a planning issue.

2.6.5. Closure of Substantial Areas or All of the Planning Area to Livestock Grazing

Livestock grazing is a well-established use within the BLM's multiple-use mandate. The BLM considered but did not analyze in detail an alternative that would make all 2.4 million acres of public lands in the planning area unavailable for livestock grazing because such an alternative is not reasonable, viable, or necessary. Instead, and in accordance with BLM's Land Use Planning Handbook and BLM IM No. 2012-169, BLM considered a range of alternatives with respect to both areas that are available or unavailable for livestock grazing and the amount of forage allocated to livestock on an area-wide basis. The range of alternatives considered includes a meaningful reduction in livestock grazing -- both through reduction in areas available to livestock grazing and forage allocation.

As discussed above, the BLM developed a range of alternatives that sharply defines the issues and provides a clear basis for choice among options by the decision-maker. The BLM analyzed closing 70,000 acres to livestock grazing under Alternative A and 83,000 acres under Alternative B where the BLM identified unresolved conflicts concerning various uses of available resources such as between bighorn sheep and elk winter forage or use of the Sweetwater Canyon pasture by recreationists and unsuitability for livestock grazing because of steepness of terrain or lack of vegetation.

The BLM also analyzed a range of alternatives that varied the amount of forage allocated to livestock. In areas open to livestock grazing, Alternative B allocates one-third less forage to livestock than Alternative A. Alternative B requires a stocking rate that will leave residual cover and forage for wildlife and wild horses, which corresponds to "light utilization" or a 21 percent to 40 percent forage-utilization percentage as compared to livestock utilization near 60 percent resulting under Alternative A. Alternative B also reduces AUMs to meet rangeland health standards. Over the twenty year analysis period, permitted AUMs under Alternative B are expected to be reduced from 280,813 to 128,750 (54 percent) and actual-use AUMs from the historic average of 204,993 to 122,320 -- a 40 percent reduction. Alternative B also includes other reductions in livestock grazing through the use of forage reserves, voluntary retirement of allotments, limitations on livestock grazing near cultural or recreation sites and limitations on the use of salt and supplements as well as prohibiting any new range infrastructure.

In addition, all alternatives would allow suitable measures which could include reduction or elimination of livestock grazing, in specific situations where livestock grazing causes or contributes to conflicts with the protection or management of other resource values or uses. Such determinations would be made during site-specific activity planning and associated environmental review. These determinations would be based on several factors, including monitoring studies, review of current range management science, input from livestock operators and interested publics, and ability to meet the standards in Appendix J (p. 1537).

Current resource conditions on BLM-administered land, including range vegetation, watershed, and wildlife habitat, as reflected in land health assessments, do not warrant prohibition of livestock grazing throughout the entire planning area. Such a blanket prohibition, in the absence of resource conflicts, would not meet the purpose and need and would be inconsistent with the policy objectives of the area. However, as described above, the range of alternatives does include a meaningful reduction in grazing throughout the planning area.

2.7. Greater Sage-Grouse Management

2.7.1. National Technical Team Report

On August 22, 2011, the BLM released its National Greater Sage-Grouse Planning Strategy. The strategy was released in response to the U.S. Fish and Wildlife Service (USFWS) decision that listing of the greater sage-grouse under the ESA was “Warranted but Precluded.” The USFWS had identified the principal regulatory mechanism for the BLM as conservation measures in RMPs.

The strategy stated that “the BLM needs to incorporate explicit objectives and adequate conservation measures into RMPs within the next three years in order to conserve greater sage-grouse and avoid a potential ESA listing.”

The strategy further identified the NTT to serve as “an independent, technical and science-based team to ensure the best information related to greater sage-grouse management is fully reviewed, evaluated and provided to the BLM for consideration in the land use planning process.”

On September 9, 2011, the Notice of Availability (NOA) of the Lander Draft RMP and EIS was published in the *Federal Register*: <https://www.federalregister.gov/articles/2011/09/09/2011-22946/notice-of-availability-of-the-draft-resource-management-plan-and-associated-environmental-impact>. The NOA stated that comments would be accepted by the BLM until December 7, 2011. At the request of the Wyoming Governor, the Fremont County Commissioners, and others, the comment period was extended to January 20, 2012.

On December 11, 2011, the BLM published a NOI to begin preparation of an EIS and Supplemental EIS to Incorporate Greater Sage-Grouse Conservation Measures into Land Use Plans and Land Management Plans. A copy of this document is available at: <https://www.federalregister.gov/articles/2011/12/09/2011-31652/notice-of-intent-to-prepare-environmental-impact-statements-and-supplemental-environmental-impact>. The comment period for the NOI ended February 7, 2012.

The NTT released a report on National Greater Sage-Grouse Conservation Measures dated December 21, 2011: <http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/wildlife.Par.73607.File.dat/GrSG%20Tech%20Team%20Report.pdf>.

On December 27, 2011, the BLM issued IM WO 2012-044, which is available at: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-044.html. This IM requires that the conservation measures in the NTT report be analyzed in at least one alternative in the land use planning EIS and that a “hard look” be given to the conservation measures, as applicable to local ecological site variability. The NTT report conservation measures were put into a table which identified the measures analyzed in the EIS and, where appropriate, why some were not analyzed. This document is provided on the Lander RMP website at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/lander.html>.

On February 15, 2012, the Wyoming BLM issued IM 2012-019 providing interim guidance for greater sage-grouse conservation during land use plan implementation. This IM may be found at: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/resources/efoia/IMs/2012.Par.56874.File.dat/wy2012-019.pdf>. The IM identifies Core Area (see discussion under *Special Status Species* in Chapter 3) as the priority habitat for greater sage-grouse in Wyoming. In the planning area, 70 percent of BLM-administered land is within Core Area. In consultation with the WGFD, the

BLM determined an additional 29 percent of the planning area was occupied greater sage-grouse habitat, and that 1 percent of the planning area was non-habitat. The non-habitat is primarily forested or mountainous areas or urban areas.

Many comments were received on the Programmatic EIS NOI. Most included recommendations that the conservation measures identified in the NTT report be incorporated as land use decisions for greater sage-grouse conservation. Additional comments stated that the NTT priority habitat conservation measures should be applied to all occupied habitat. Other comments addressed issues such as wild horses without articulating a tie to greater sage-grouse, which might have considerations or insight into a planning document for an entire resource management area.

The NTT report and the comments on the Programmatic EIS NOI raised issues that merit evaluation in the Lander RMP. Many of these issues had already been addressed and were part of the Draft RMP and EIS published September 9, 2011. Most prominent is the analysis of a 2.5 percent cap on surface disturbance and a greater sage-grouse ACEC. Other important, but subtle, greater sage-grouse protective measures were analyzed, including limits on road proliferation, ROW exclusion and avoidance areas, and habitat protective measures.

Moreover, the Draft RMP and EIS analyzed extensive protections for other resources that had the secondary effect of protecting greater sage-grouse habitat. The 1987 RMP established ACECs to protect big-game habitat, viewsheds, elk crucial winter and parturition ranges, and cultural features, including the four NHTs that cross through the resource area. The Draft RMP and EIS evaluated continuing these protections (Alternative A), expanding them (Alternative B), eliminating them (Alternative C), or some combination thereof (Alternative D).

With the NTT report and comments on the Programmatic EIS NOI being received during the period following the public comment period to the Lander Draft RMP and EIS, the BLM was able to evaluate the information and identify what had been part of the original analysis and what was not, and how consideration of the new matter might change the earlier analysis. The recommendations from the NTT report and a description about how the Lander RMP addresses those recommendations is provided on the Lander RMP website.

The NTT report identified recommendations to be evaluated for application in priority habitat areas, which the State of Wyoming has defined as Core Area (see the Wyoming Governor's Greater Sage-grouse Core Area strategy at: http://wgfd.wyo.gov/web2011/Departments/Wildlife/pdfs/SAGEGROUSE_EO_COREPROTECTION0000651.pdf) and some recommendations for general habitat areas. The Lander Field Office worked with the WGFD to identify what parts of the planning area constituted general habitat areas and what was not greater sage-grouse habitat. The results, described in *Chapter 3*, showed that 99 percent of the planning area was occupied habitat, consisting of Core Area (70 percent) and general habitat areas (29 percent), while 1 percent was non-habitat. Other general habitat areas and priority habitat areas mapping efforts are ongoing and may differ in small respects from the Lander habitat determinations. The BLM is basing its analysis of impacts to greater sage-grouse on the mapping it did in consultation with the WGFD; any deviation from other mapping results is unlikely to have consequences on the scale of the planning area. Moreover, with the possible exception of a few scattered BLM tracts in close proximity to the City of Lander, all of the non-habitat areas are protected as ACECs for other resources, including bighorn sheep and elk. Whether or not greater sage-grouse protections would apply in these areas (and many others in general habitat areas), alternatives A, B, and D analyzed wildlife protections that would secondarily benefit greater sage-grouse that might be occasionally present in the areas or pass through it during migration.

Various recommended conservation practices are reasonable when applied to isolated or scattered parcels. However, when applied to generally contiguous 1,680,000 acres, or 70 percent of the planning area, the overall impact can be to restrict uses in a way that does not meet basic policy objectives for the area. The purpose and need for the RMP is to have a plan that balances protections and uses. Moreover, some of the groups commenting on the NOI recommended that the conservation measures be applied to all occupied habitat, or 99 percent of the planning area (with the remaining 1 percent protected for other wildlife values). Emphasizing wildlife conservation at the expense of all other uses is appropriate for a management plan for a wildlife refuge, not the FLPMA-mandated variety of uses of the public lands. Closing all occupied habitat to leasing, would preclude new oil and gas development in areas that the BLM believes to have moderate to high potential, which would carry substantial fiscal costs and result in an imbalance among resources and resource uses. Restricting livestock grazing on all occupied habitat not only during early brood-rearing (as recommended in the NTT report), but during all nesting brood-rearing, and in winter habitat, would preclude all livestock grazing, even where rangeland health standards were achieved.

Similarly, excluding ROWs in all occupied habitat would not meet the purpose and need for the RMP because such vast amounts of habitat exist. Under BLM guidance, exclusion is a complete prohibition without exception. To limit new ROWs to only 1 percent of the planning area, whether or not co-located in existing disturbance or in a designated corridor, would preclude new authorized activities. However, Alternative B analyzes excluding ROWs in all ACECs, including the Government Draw/Upper Sweetwater Sage-grouse ACEC. This management analyzed excluding ROWs in 80 percent of the planning area, avoiding 13 percent of the planning area. Impacts analysis showed that this management had a substantial adverse impact on all resource uses.

Some recommendations such as certain Required Design Features (generally referred to as Best Management Practices [BMPs]) could be analyzed for the entire planning area and still meet the purpose and need. Other BMPs could not be applied as mandatory parts of all development because without a site-specific analysis, it could not be determined if the application of the BMP would have the effect of precluding the activity. The analysis of the recommendations of the NTT report include BMPs such as locating compressor stations used in connection with oil and gas development outside of Core Area. At its widest point, Core Area in the planning area is 70 by 60 miles in size. Depending on the development, requiring that a needed compressor be located outside of Core Area would have had the effect of precluding the development of that oil and gas lease because engineering might not support a location 30 or 40 miles distant.

On a planning area-wide basis, the BLM lacks the data to evaluate the environmental impacts of applying some of the recommendations without regard to site-specific considerations. For example, requiring compressor stations be located outside of Core Area, as recommended in the NTT Report, could have the effect of making the piping of product unfeasible if the compressor is too far away to achieve the needed pressure in the pipeline. The BLM determined that in the absence of the data that would allow the BLM to evaluate the impacts from the proposed management, it would be arbitrary to require them without analysis. However, it is entirely possible to defer the analysis to a site-specific basis and require that they be analyzed in a project-level NEPA review.

This EIS analyzes the impacts from the mandatory Required Design Features that are applied to every development or surface disturbance in the planning area. Many of these offer protections to many wildlife species and also to livestock, wild horses, and human health and safety.

Accordingly, the EIS analyzes these Required Design Features as being appropriate for all surface disturbance and not just oil and gas development in Core Area. The BMPs not incorporated in the RMP as Required Design Features will be evaluated on a site-specific basis for inclusion as Conditions of Approval (COA) with a thorough or “hard look” at the BMPs that are not made COA.

2.7.2. Timeframes for Travel Management Implementation Planning as Recommended by BLM Policy and in Support of Greater Sage-Grouse

BLM Land Use Planning policy and the NTT report recommend that BLM conduct travel management implementation planning concurrently with land use planning. This includes individual route decisions, such as closure, open to motorized use, limited seasonally, and other conveyance limitations. Importantly, such decisions are required to be based on sight-specific analysis of the individual linear feature. Initially the BLM thought that conducting travel management implementation planning concurrent with the RMP was possible during this planning process.

BLM policy also outlines the necessary data elements required if implementation planning is to be deferred; these items are contained in Appendix W (p. 1813).

Importantly, BLM policy and the NTT report also state that travel management implementation planning should be completed 5 years after the signing of the ROD. Multiple BLM offices (several of them smaller in size than the Lander Field Office) have found that this timeline is not achievable. In addition, 70 percent of the planning area is greater sage-grouse Core Area; therefore it also will not be possible to conduct implementation planning within the 5-year timeframe in greater sage-grouse priority habitat. Therefore, neither recommendation is feasible under current budget and staffing levels. The timeline reflected in Appendix W (p. 1813) reflects an optimistic schedule for travel planning and assumes existing staffing levels as well as limited amounts of funding increases. Importantly, these areas were prioritized based on many factors – the 15 areas with priority greater sage-grouse habitat were prioritized higher than the 2 areas without the habitat. These timelines can be compacted in the event of increased funding and/or non-BLM partner assistance.

There were many suggestions regarding appropriate travel management in greater sage-grouse habitat, including priority habitat (Core Area) and all occupied habitat. Management under the 1987 RMP prohibits cross-country motorized travel and limits travel to existing and designated roads and trails. Alternatives B, C, and D limit travel to existing roads as an interim designation until route-specific planning can occur. Appendix W (p. 1813) identifies how implementation-level planning will occur and identifies preliminary travel management areas as well as the proposed order for analysis. The proposed outcome for travel management implementation in this plan is to designate all the BLM-administered surface as limited to designated routes subject to other limitations where applicable, or closed to motorized travel.

In the interim, Alternative D limits disruptive activities in greater sage-grouse Core Area; it should be noted, however, that casual motorized vehicle use is not considered a disruptive activity. Core Area includes 70 percent of the planning area. Occupied habitat includes an additional 29 percent of the planning area. The 1 percent that is not habitat for greater sage-grouse has seasonal restrictions for the benefit of other wildlife. Restrictions that would either entirely preclude travel

throughout the planning area or seasonally, are beyond the purpose and need of the EIS and would unreasonably limit multiple-use management.

During travel management implementation, impacts to greater sage-grouse from travel management will be evaluated on a site-specific basis (along with other considerations, such as other wildlife values).

2.7.3. Modifications to Issued Authorizations

Comments on the Programmatic EIS to Incorporate Greater Sage-Grouse Conservation Measures into Land Use Plans and Land Management Plans (described above) suggested adding conservation measures to already-issued authorizations such as oil and gas leases and ROWs. The BLM had very early in preparing the Draft RMP and EIS considered modifying leases and other authorizations ex post facto and determined that doing so would not meet the purpose and need, which is to support valid and existing rights.

Some of the conservation measures that were suggested be applied to existing authorizations will be applied if the term of the authorization ends. If an oil and gas lease is not held by production or suspended, it terminates at the end of 10 years. If the lease is offered again, it would be a new lease, and subject to lease stipulations required by the RMP even though the earlier lease was not subject to those stipulations. When a ROW term ends, if the BLM re-issues the grant, it is a new authorization subject to the then-required protections.

The EIS identified opportunities to work with partners or to otherwise obtain funding to “buy out” existing rights, such as claimed mineral estate. However, site-specific NEPA analysis would be required to determine if that money usage provided the most benefits to greater sage-grouse in comparison to other uses. For example, if an oil and gas company wished to utilize offsite mitigation or compensatory mitigation, site-specific analysis would be required to determine the most beneficial offset. If degraded riparian-wetland areas, for example, were identified as an opportunity for offsite mitigation, that might be a more preferable approach than buying out an existing right. This is in accord with the NTT report which states, “Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit sage-grouse.”

2.7.4. Historic Climax Plant Community

Several commenters suggested using different approaches to achieve vegetation objectives. Historic Climax Plant Community or Potential Natural Condition and perhaps others have their advantages and disadvantages as theoretical approaches. The Lander RMP manages according to the U.S. Department of Agriculture (USDA) NRCS Ecological Site Descriptions. The decision to use this methodology or approach was based on a determination that Ecological Site Descriptions were tied to local soil and precipitation and were the basis for conducting rangeland monitoring and land health assessments. Further, Ecological Site Descriptions allow for management in accordance with site potential. Cagney et al. (2010) observed that some plant communities have transitioned to a state that cannot return to the reference Historic Climax Plant Community without intervening management. Sites in this state could not return to the reference state simply by a change or cessation of livestock grazing. The authors’ research identified that events such as extensive vegetation treatments and reseeding or landscape fires followed by decades of rest could be required to reverse transitions that had taken place over decades. Such interventionist

management is not recommended in greater sage-grouse habitat, particularly Core Area, as demonstrated by many of the NTT recommendations. By managing in accordance with site potential (via the Ecological Site Descriptions) the current potential of the rangeland sites could be used to set greater sage-grouse parameters. The BLM made the decision to analyze vegetation objectives in terms of what could be achieved rather than a theoretical analysis that could not be achieved on the ground.

2.7.5. Invasive Nonnative Species Management and Greater Sage-Grouse

The USFWS and others have not identified cheatgrass and other invasive plants as being a primary threat to greater sage-grouse in the planning area. Habitat loss or degradation through riparian-wetland areas not meeting PFC or through the encroachment of juniper are the greater risk. Accordingly, treatment of invasive species was determined to be a less important use of range improvement funds than other treatments.

Treatment is expensive and with uncertain success at best. It involves highly disruptive management with potential for adverse impacts to greater sage-grouse. With limited budgets available for pest treatments, the BLM chose to emphasize reducing the likelihood of spread through management actions such as requiring livestock flushing, washing of vehicles, and limited surface disturbance.

Identified conservation measures such as not driving through areas with infestation would have the effect of precluding motor vehicle use, because by far the heaviest concentration of invasive nonnative species are along the roadways, as can be seen on Map 46.

Alternative B uses all funds that are available for range improvement projects for non-infrastructure uses such as vegetation treatments and habitat improvement. While current research suggests that vegetation treatments need to be undertaken only after careful analysis of the potentially adverse impacts to greater sage-grouse, the use of prescribed fire is limited as well. Approximately 76 percent of Core Area has less than 12 inches of annual precipitation, so prescribed fire, a type of vegetation treatment, has only marginal benefits to Core Area.

Alternatively, these funds could have been allocated for invasive species treatment. However, there are management opportunities for greater sage-grouse habitat improvements such as treating juniper encroachment or improving riparian-wetland function that the BLM determined would have a greater beneficial impact on greater sage-grouse than treatments to control invasive nonnative species.

2.7.6. Conservation Measures Requiring Site-Specific Analysis

Some of the NTT report conservation measures have the potential for considerable adverse impacts to resource uses if universally required in all parts of priority habitat, such as the large and generally contiguous type of priority habitat present in the planning area. Excluding activities from priority habitat limits those activities to less than 29 percent of the planning area. Adverse impacts associated with the conservation measures that require that facilities that support Core Area activities be located out of priority habitat could present such technical challenges that activities authorized in Core Area (oil and gas development below the surface caps) could be precluded because they are located too far from non-priority habitat for remote

location of facilities. For example, a requirement that all or certain types of oil and gas development infrastructure such as liquid gathering facilities be sited out of Core Area could make development of existing leases technically infeasible if engineering considerations could not be met at a distance (see item 137 on the NTT Conformance Table on the Lander RMP website [<http://www.blm.gov/wy/st/en/programs/Planning/rmps/lander.html>]). Broad statements of required conservation management may not be justified in all cases given the habitat variation and the size of the Core Area in the Lander Field Office.

Similarly, recommendations such as “no exceptions” to greater sage-grouse Core Area timing limitations, when applied to 70 percent or more of the planning area is unreasonable when applied to such a large area. The alternatives contain waiver and exception criteria and a process to prevent exceptions being improperly granted. But if protections are followed and no adverse impacts to wildlife would result, there is no rational or scientific reason to refuse to exclude all ROWs. The exception criteria emphasizes the care with which greater sage-grouse timing limitations should be waived. In fact, the BLM regularly denies requests for exceptions, particularly for greater sage-grouse protection. However, there are circumstances when an exception might be granted even if the immediate consequence might be adverse to greater sage-grouse if the alternative would be far more adverse. An example would be if drilling had not been completed by the time seasonal restrictions were in place. An evaluation of the consequences of stopping the drilling program, plugging the well, and removing the equipment, only to repeat the process the following summer might be more adverse than a 1 week exception that allowed the work to be completed without further disruption.

Other examples of well-supported conservation recommendations that need site-specific evaluation are reclamation techniques, the use of Master Development Plans (Recommendation 59 in the NTT Conformance Table on the Lander RMP website) rather than Plans of Development with approval at the Application for Permit to Drill stage, location of facilities that have inherent engineering requirements outside of Core Area. These and many other recommended practices are not reasonable because they would place restrictions on a very large area of land without consideration for particular site-specific features. The EIS analyzed extensive Required Design Features, surface-disturbance caps, avoidance areas, and limitations on surface occupancy. Alternative D would require the BLM to evaluate as potential COAs, on a site-specific basis, these and others that will be developed over time based on an increasing research base and scientific understanding.

2.8. Management Actions Common to All Alternatives

Laws, regulations, and other guidance mandate a variety of management actions under all alternatives. For example, all alternatives must comply with the Clean Water Act (CWA) and the Wyoming Department of Environmental Quality (DEQ) smoke management rules for air quality. The BLM is required by law to follow these regulations and as such these management actions do not vary by alternative. Planning criteria ensure that all alternatives comply with these nondiscretionary laws and regulations (refer to Chapter 1, Planning Criteria). These management actions are referred to as “common to all alternatives,” because they apply regardless of the alternative. A listing of the laws and regulations that provide some of these mandates are identified in Appendix A (p. 1427).

Some management actions common to all alternatives specify areas that are off-limits to mineral development and other activities because they are incompatible with the area’s resource values and would not be allowed under any alternative. Many resource programs require the use of

BMPs to reduce impacts on resource values or management objectives such as to reduce point and nonpoint source pollution to protect water quality. Collaboration with stakeholders and the development of resource specific plans are also a common requirement across resource programs under all alternatives. For example, cultural resources management requires cooperating with local government and stakeholders in consideration of the economic and social impacts of protecting cultural resources. For fish and wildlife resources, the BLM must cooperate with stakeholders and local governments to develop management strategies to prevent the introduction and spread of aquatic invasive species.

All alternatives consider some limitation on resource uses — these limits are a result of management actions for the protection of other values. In the management actions under all alternatives, the effects of these limits are stated in the respective resource use, such as acres closed to oil and gas leasing. For example, management actions for the protection of bighorn sheep in Dubois are identified in the Whiskey Mountain ACEC section of Chapter 2 but the impacts (such as closure to oil and gas leasing) contribute to the acres closed to oil and gas leasing identified in the minerals section. The same is true for livestock grazing, travel management and other resource uses.

The alternatives all analyze withdrawing land from locatable mineral activities. Section 103 of FLPMA defines the term “withdrawal” to mean “withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program.”

Section 204 of FLPMA identifies the process for a land use plan to withdraw areas from locatable mineral entry. The Secretary of the Interior is authorized to withdraw lands from mining laws following certain procedures. These vary depending on whether the proposed withdrawal is less than 5,000 acres or greater than 5,000 acres. Alternatives A, B, and D propose withdrawing 23,114, 1,632,605, and 449,068 acres, respectively, from the locatable mining laws. These proposed withdrawals include some that are less than 5,000 acres and some that are greater than 5,000 acres. The primary difference between the two processes is that a withdrawal greater than 5,000 acres requires the preparation of an extensive report to support the withdrawal, including a specialist’s analysis of the area’s mineral potential, and notification to Congress of the proposed withdrawal. Congress may then choose to terminate the withdrawal by concurrent resolution. Withdrawals created after FLPMA’s enactment in 1976 cannot be for a period longer than 20 years and must be completed within 2 years following the land use plan decision to pursue the withdrawal.

The process of requesting or applying for the Secretary of the Interior to withdraw the lands is started by the identification of lands in the RMP for which to pursue a withdrawal. Following this RMP decision, a mineral potential report must be prepared to include all of the information required by FLPMA, 43 CFR 2310, and BLM Manual 3060. The withdrawal request, including the mineral potential report, is submitted to the Secretary, who then determines if it should be sent to Congress or denied.

As indicated in several places in this EIS, the RMP is not the decision that withdraws the lands from the mining laws, merely the first step in a lengthy process. It is entirely possible that withdrawals identified in the ROD will not be withdrawn or perhaps not even reach the next step in the process if the Lander Field Office does not complete the supporting report. Therefore, the use of the term “withdrawn” in connection with locatable minerals is a misnomer to the extent it

implies that withdrawal is an RMP decision. The RMP decision is to identify lands for which a locatable mineral withdrawal will be pursued. For the sake of readability, however, these lands are identified as “withdrawn” and the different process for a withdrawal of less than 5,000 acres is not separately discussed.

To have a method of comparing alternatives and their impacts, it is assumed that areas identified to pursue withdrawal will actually result in withdrawal occurring. In addition, unless a withdrawal of public domain land specifically provides otherwise, the land withdrawn is presumed to be available for oil and gas leasing on a discretionary basis as specified in the Mineral Leasing Act of 1920 (as amended), and any other applicable land use decisions.

Tables 2.7 through 2.52 provide a complete list of management actions common to all alternatives for each resource.

2.9. Summaries of Alternatives

This section summarizes the four alternatives (A through D) considered in detail in this RMP and EIS. Due to the breadth of management prescriptions in the alternatives, this section describes only the key elements of alternatives. The summary descriptions provide a general overview of each alternative, the management emphasis associated with each alternative, and key management actions for each alternative. Tables 2.7 through 2.52 provide detailed descriptions of the alternatives. The maps in Appendix B (p. 1445) further illustrate differences in acreage allocations and management prescriptions by alternative.

Alternatives B and C were developed to provide a range of management for analysis. Broadly put, over the course of alternative development, Alternative B and Alternative C gradually evolved into two different approaches to managing public lands. The BLM must meet certain mandates such as the Wyoming Standards for Healthy Rangelands, restoring riparian-wetlands that are not meeting PFC, and protecting special status species. Similarly, BLM is mandated to provide for resource uses such as making energy resources available and supporting economic benefits from the public lands.

Since these mandates apply across all alternatives, the range of management actions required by NEPA is found in the method by which the BLM will meet the mandates. The BLM developed two different methods: one that is a lower level of intervention, using natural processes and avoiding new rangeland infrastructure to reach mandated goals (Alternative B), and one that utilizes a high level of human intervention and resource use (Alternative C). Management under alternatives A and D generally falls in between this range of management.

Alternative A represents continuation of current management and provides a baseline from which to identify potential environmental consequences when compared to the action alternatives. Alternative A describes current resource and land management direction in the planning area under the existing plan. Alternative A establishes rangeland improvement projects on a case-by-case basis and establishes allotment stocking rates to maximize utilization of forage in areas preferred by livestock, while achieving standards for healthy rangeland. Current management identifies constraints on mineral leasing in the planning area to protect resource values that are incompatible with mineral resources activity. The BLM would continue to manage vegetative communities to meet vegetative attributes as identified in the Natural Resource Conservation Service’s Ecological Site Guides and utilize vegetation treatments to increase forage production while meeting the Wyoming Standards for Healthy Rangelands. Current management

includes nine ACECs and nine WSR eligible waterways. Constraints on resource uses specifically to protect fish and wildlife resources are only used in a few cases under Alternative A, including seasonal limitations on surface-disturbing activities in important habitat and buffers to restrict surface-disturbing activities around greater sage-grouse leks.

Alternative B emphasizes resource protection over resource use. Greater sage-grouse nesting habitat is closed to oil and gas leasing and all of the proposed ACECs are closed to almost all mineral activities. With areas that have potential resource conflicts closed to oil and gas leasing, MLPs would not be used as a tool to provide more site-specific resource protections. Alternative B uses a low infrastructure approach for resource management. In making progress towards Wyoming Standards for Healthy Rangelands including riparian-wetland health, Alternative B avoids infrastructure, such as fencing, and focuses on livestock grazing management through such systems as seasons of use and lower forage utilization. Because infrastructure will only rarely be built, range improvement projects will emphasize vegetation treatments. Over time, livestock grazing AUMs are expected to decrease or seasons of use shortened in order to continue to make progress towards meeting the Standards. Timber cutting is allowed where natural processes are not able to improve forest health but clear-cuts are prohibited unless they are determined to be warranted in order to mimic natural processes. Alternative B establishes several Special Recreation Management Areas (SRMAs), most in areas of high recreational value, such as Congressionally Designated Trails. The recreational setting of these SRMAs is managed to facilitate specific recreation opportunities, which may limit other types of uses, such as energy development.

Alternative B is more protective of resources such as wildlife and viewshed, utilizing more restrictions on resource uses. These are discussed in more detail below. Alternative B continues (and in some cases expands) existing ACECs and proposes new ACECs and more extensive protections of the Congressionally Designated Trails. Alternative B affords the greatest protections of greater sage-grouse and provides the most limits on ROWs including wind-energy development projects. Alternative B emphasizes protections of the Congressionally Designated Trails with a broad buffer to limit development that would intrude on the setting and recreational use.

Alternative C has fewer protections of resources and focuses on a more intensive human presence on the land to achieve mandated goals. In Alternative C, if rangelands are not meeting Wyoming Standards for Healthy Rangelands, infrastructure including fences and water development projects are utilized along with livestock grazing management to improve conditions. Over time, extensive additional infrastructure will be used to make progress towards meeting the Standards. As a consequence of this emphasis, there will be fewer rangeland improvement projects in the form of vegetation treatment. Timber commodity availability is protected with full fire suppression. Extractive and other industrial uses are maximized, resulting in fewer protections of resources. Alternative C manages the values protected by the existing and proposed ACECs with standard management rather than ACEC designation and the Congressionally Designated Trails with a ¼-mile buffer. Far fewer limitations on ROWs, including wind-energy development projects, are proposed in Alternative C and protections for greater sage-grouse are afforded on a case-by-case basis. Alternative C does not guarantee recreational use; if a conflict arises, the recreational use would shift.

Alternative D balances the use and conservation of planning area resources. The use of range improvement projects is authorized pursuant only to a Comprehensive Grazing Strategy that would help to meet Wyoming Standards for Healthy Rangelands. Alternative D designates the

second largest land area as ACECs and emphasizes moderate constraints on resource uses (e.g., mineral development) to reduce adverse impacts to resource values. Fish and wildlife resources under Alternative D, in general, receive more protection compared to Alternative A, especially within important habitat areas. Under Alternative D, the Wyoming Governor's Greater Sage-grouse Core Area strategy is incorporated into management actions. In areas of high mineral potential, Designated Development Areas (DDA) are established which emphasize mineral use. In Dubois, mineral activities are limited and the area is closed to oil and gas leasing for the protection of special status species and to support destination recreation associated with bighorn sheep. Congressionally Designated Trails are managed within the NTMC, which applies specific prescriptions to protect the trails and their resources, qualities, values, and associated settings, and the primary use or uses. Alternative D closes some areas to mineral development including locatable mineral entry. The Beaver Rim area is identified for an MLP to protect important resources.

Table 2.4, "Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area" (p. 45) lists acreage allocations for resources and resource uses by alternative. In general, avoidance or exclusion of surface-disturbing activities or a particular resource use (e.g., ROW avoidance or exclusion) limits or restricts development activities in these areas to preserve resource characteristics or meet management objectives of a resource program (e.g., prohibiting surface-disturbing activities on slopes greater than 25 percent to decrease soil erosion). Acreage allocations under each alternative reflect the general theme of each alternative (e.g., area open to mineral development is the least under Alternative B to limit adverse impacts to certain physical and biological resources). Acreage figures in Table 2.4, "Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area" (p. 45) are reported for BLM-administered surface, BLM-administered mineral estate, and total surface area in the planning area. Acres of BLM-administered surface include all surface lands managed by the BLM (Map 1). BLM-administered mineral estate includes the sub-surface mineral estate administered by the BLM, including federal mineral estate underlying BLM-administered surface and underlying non-federal land, or split-estate (Map 2). Total surface in the planning area includes all BLM-administered surface as well as private ownership, tribal lands, state lands, and lands managed by other federal agencies (Map 1). The acreage of BLM-administered surface and BLM-administered mineral estate in the planning area is displayed below in Table 2.3, "Acreage of Surface Land and Mineral Estate in the Planning Area" (p. 44) for reference when viewing the summary tables below.

Table 2.3. Acreage of Surface Land and Mineral Estate in the Planning Area

BLM-Administered Surface	BLM-Administered Mineral Estate
2,394,210	2,809,101
Source: BLM 2012a	
BLM Bureau of Land Management	

Table 2.5, "Comparative Summary of Areas of Critical Environmental Concern by Alternative" (p. 50) lists acreage allocations and the emphasis for management in proposed ACECs. ACECs are managed to protect and prevent irreparable damage to important historic, cultural, scenic, and biological values, and other natural systems or processes. ACECs are also designated to protect life and ensure safety from natural hazards. In general, management in ACECs limit development and surface-disturbing activities that may affect these important values.

For a more detailed discussion of recreation management areas see Appendix C (p. 1453).

All of the tables below provide a comparative summary of acreage allocations under the four alternatives.

Table 2.4. Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area

Topic	Acreage Type	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
Physical, Biological, and Heritage and Visual Resources					
Slopes Greater than 25 Percent (Surface-disturbing Activities Prohibited)	BLM-Administered Surface	182,345	-	182,345	182,345
Slopes Greater than 15 Percent (Surface-disturbing Activities Avoided for Category 3-5 restrictions)	BLM-Administered Surface	-	413,670	-	-
Greater Sage-grouse Occupied Leks Protective Buffer (Surface-disturbing Activities Prohibited)	Total Surface in the Planning Area	20,140	112,218	20,140	145,585 ¹
	BLM-Administered Surface	16,283	93,411	16,283	122,890 ¹
	BLM-Administered Mineral Estate	18,025	101,315	18,025	131,706 ¹
Greater Sage-grouse Nesting Habitat Protective Buffer (Surface-disturbing and Disruptive Activities Subject to Seasonal Limitations)	Total Surface in the Planning Area	966,736	1,680,580	966,736	2,354,825 ²
	BLM-Administered Surface	794,452	1,339,609	794,452	1,806,547 ²
	BLM-Administered Mineral Estate	861,519	1,483,088	861,519	2,024,402 ²
Raptor Nest Protective Buffer (Surface-disturbing and Disruptive Activities Subject to Seasonal Limitations)	BLM-Administered Surface	301,237	781,643	158,199	380,115
	BLM-Administered Mineral Estate	337,588	873,378	177,391	421,105
Elk Winter Range (Surface-disturbing and Disruptive Activities Subject to Seasonal Limitations) ³	Total Surface in the Planning Area	354,963	354,963	0	373,987
	BLM-Administered Surface	166,525	166,525	0	235,217
	BLM-Administered Mineral Estate	221,232	221,232	0	294,865
Big Game Crucial Winter Range (Surface-disturbing and Disruptive Activities Subject to Seasonal Limitations) ³	Total Surface in the Planning Area	1,055,702	1,055,702	1,055,702	1,138,471
	BLM-Administered Surface	605,898	605,898	605,898	647,231
	BLM-Administered Mineral Estate	809,393	809,393	809,393	871,020
Wild Horse Herd Management Areas	BLM-Administered Surface ⁴	642,081	642,081	642,081	642,081

Topic	Acreage Type	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
Warm Springs Canyon Flume – Management to protect the site as a National Register-eligible property	BLM- Administered Surface	557	834	557	557
Visual Resource Management – Class I	BLM- Administered Surface	57,443	59,317	55,360	60,115
	BLM- Administered Mineral Estate	58,316	60,548	54,994	61,089
Visual Resource Management – Class II	BLM- Administered Surface	202,785	1,284,122	25,730	780,810
	BLM- Administered Mineral Estate	272,523	1,524,787	34,689	996,574
Visual Resource Management – Class III	BLM- Administered Surface	222,121	292,890	722,356	857,979
	BLM- Administered Mineral Estate	302,766	348,132	855,614	951,079
Visual Resource Management – Class IV	BLM- Administered Surface	1,853,862	756,813	1,590,758	694,759
	BLM- Administered Mineral Estate	2,109,234	873,572	1,863,789	799,571
Visual Resource Management – Class V ⁵	BLM- Administered Surface	57,995	-	-	-
	BLM- Administered Mineral Estate	66,258	-	-	-
Non-WSA Lands with Wilderness Characteristics Managed to Protect Wilderness Values	BLM- Administered Surface	-	5,490	-	4,954
Resource Uses and Support					
Mineral Resources					
Available for Locatable Mineral Entry	BLM- Administered Mineral Estate	2,777,334	1,167,862	2,800,467	2,351,399
Pursued for Withdrawal from Locatable Mineral Entry	BLM- Administered Mineral Estate	23,114	1,632,605	0	449,068
Existing pre-FLPMA Withdrawals	BLM- Administered Mineral Estate	8,634	8,634	8,634	8,634
Open to Geothermal Leasing Subject to Standard Lease Stipulations	BLM- Administered Mineral Estate	728,277	6,287	797,174	53,898
Open to Geothermal Leasing with Moderate Constraints	BLM- Administered Mineral Estate	1,703,913	322,717	1,738,283	1,198,821

Topic	Acreage Type	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
Open to Geothermal Leasing with Major Constraints	BLM-Administered Mineral Estate	242,226	175,369	165,747	859,566
Closed to Geothermal Leasing	BLM-Administered Mineral Estate	134,686	2,304,728	107,897	696,816
Open to Oil and Gas Leasing Subject to Standard Lease Stipulations	BLM-Administered Mineral Estate	731,144	32,952	804,794	44,945
Open to Oil and Gas Leasing Subject to Moderate Constraints	BLM-Administered Mineral Estate	1,715,341	309,100	1,755,628	1,260,715
Open to Oil and Gas Leasing Subject to Major Constraints	BLM-Administered Mineral Estate	337,481	187,524	248,601	1,336,867
Closed to Oil and Gas Leasing	BLM-Administered Mineral Estate	25,136	2,279,525	78	166,574
Open to Phosphate Leasing Subject to Standard Lease Stipulations	BLM-Administered Mineral Estate	2,590,482	551,440	2,642,047	1,539,655
Closed to Phosphate Leasing	BLM-Administered Mineral Estate	218,619	2,257,661	167,054	1,269,446
Open to Disposal of Mineral Materials	BLM-Administered Mineral Estate	2,493,980	209,842	2,620,997	1,853,090
Closed to Disposal of Mineral Materials	BLM-Administered Mineral Estate	315,121	2,599,259	188,104	956,011
Lands and Realty					
Surface Ownership Retained	BLM-Administered Surface	2,385,637	2,388,774	2,388,774	2,386,137
Land Available for Disposal by Sale, Exchange, or Other Means	BLM-Administered Surface	8,573	5,436	5,436	8,073
Land Available for Disposal with Restrictions on Use	BLM-Administered Surface	1,475	1,435	1,435	6,665
Renewable Energy					
Acres Open to Wind-Energy Development	BLM-Administered Surface	2,113,512	41,372	2,284,235	224,289
Wind-Energy Avoidance Areas	BLM-Administered Surface	64,816	23,887	15,818	1,215,599
Wind-Energy Exclusion Areas	BLM-Administered Surface	215,882	2,328,951	94,157	954,322
Rights-of-Way					
ROW/Utility Corridor Areas	BLM-Administered Surface	4,892	15,364	660,908	103,646

Topic	Acreage Type	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
ROW Avoidance Areas	BLM-Administered Surface	66,099	315,219	11,714	1,369,300
ROW Exclusion Areas	BLM-Administered Surface	205,916	1,919,029	147,053	417,426
Motorized Travel					
Acres Closed to Motorized Travel	BLM-Administered Surface	5,923	71,761	5,472	26,357
Acres Seasonally Closed to Motorized Travel	BLM-Administered Surface	111,002	116,805	-	110,530
Acres Limited to Designated Roads and Trails for Motorized Travel	BLM-Administered Surface	163,075	193,704	50,776	154,772
Acres Limited to Existing Roads and Trails for Motorized Travel	BLM-Administered Surface	2,226,504	2,128,741	2,337,958	2,213,081
Acres Closed to Over-snow Vehicle Use	BLM-Administered Surface	14,729	181,173	-	70,425
Recreation Management Areas					
Total Acreage of SRMAs	BLM-Administered Surface	406,457	307,183	608	293,774
Total Acreage of ERMAs	BLM-Administered Surface	163,187 ⁶	799,504 ⁶	901,250 ⁶	232,275
Livestock Grazing					
Acres Available for Livestock Grazing	BLM-Administered Surface	2,324,934	2,312,095	2,324,934	2,317,368
Acres Not Available for Livestock Grazing ⁷	BLM-Administered Surface	69,276	69,276	69,276	69,276
Acres Closed to Livestock Grazing	BLM-Administered Surface	-	12,839	-	7,566
Special Designations					
National Landscape Conservation System	BLM-Administered Surface	101,100	101,100	101,100	101,100
Wild and Scenic Rivers (Eligible Waterways Managed as Suitable for Inclusion in the NWSRS) ⁸	BLM-Administered Surface	9,919 ⁹	9,919	-	6,153
Wilderness Study Areas	BLM-Administered Surface	55,338	55,338	55,338	55,338

Topic	Acreage Type	Alternative A (Acres)	Alternative B (Acres)	Alternative C (Acres)	Alternative D (Acres)
Number of Areas of Critical Environmental Concern (See Table 2.5, "Comparative Summary of Areas of Critical Environmental Concern by Alternative" (p. 50))	Total number	9	15	-	8
<p>Source: BLM 2012a</p> <p>¹Buffer acres were calculated around newly available greater sage-grouse lek perimeters for Alternative D versus around lek points in alternatives A, B, and C.</p> <p>²The increase in acreage results from all suitable nesting habitat and early brood-rearing habitat within greater sage-grouse Core Area being subject to seasonal protection versus the lek buffer approach used in alternatives A, B, and C.</p> <p>³Acreage reported for Alternative D reflects best available data at time of publication. Except for elk winter range management under Alternative C, management does not vary by alternative.</p> <p>⁴Acreage includes portions of Wild Horse Herd Management Areas outside of the planning area.</p> <p>⁵VRM Class V no longer exists as a class objective option for managing visual resources. As a result, these areas are managed as Class IV visual resources under Alternative A.</p> <p>⁶Excludes the general Lander ERMA which includes all lands not managed as separate SRMAs or ERMAs.</p> <p>⁷38,058 acres have been determined to be OSA (Outside Service Area) and unsuitable for grazing. 31,218 acres include a small number of areas such as wildlife areas closed to grazing in 1987 for wildlife values and some additional lands that should be OSA or identified as grazed but managed by other field offices.</p> <p>⁸Acreage derived using a ¼-mile buffer around each waterway.</p> <p>⁹All eligible waterways under Alternative A are managed to protect the free-flowing outstandingly remarkable values and tentative classification.</p> <p>BLM Bureau of Land Management ROW right-of-way ERMA Extensive Recreation Management Area SRMA Special Recreation Management Area FLPMA Federal Land Policy and Management Act VRM Visual Resource Management OSA Outside Service Area WSA Wilderness Study Area NWSRS National Wild and Scenic River System WSR Wild and Scenic River</p>					

Table 2.5. Comparative Summary of Areas of Critical Environmental Concern by Alternative

ACEC Name	Value(s) of Concern	Alternative A		Alternative B		Alternative C		Alternative D	
		Existing Designation	BLM Surface (Acres)	Proposed Designation	BLM Surface (Acres) ¹	Proposed Designation	BLM Surface (Acres)	Proposed Designation	BLM Surface (Acres)
Lander Slope	Fish and wildlife, scenic values, natural processes	ACEC	25,065	ACEC	25,065	No ACEC	-	ACEC	25,065
Red Canyon	Wildlife, special status species, scenic values, geologic features	ACEC	15,109	ACEC	15,109	No ACEC	-	ACEC	15,109
Dubois Badlands	Wildlife, soils, scenic values	ACEC	4,903	ACEC	4,903	No ACEC	-	No ACEC	-
Whiskey Mountain	Wildlife, scenic values	ACEC	8,776	ACEC	8,776	No ACEC	-	ACEC	8,776
East Fork	Wildlife	ACEC	4,431	ACEC Expansion	7,744	No ACEC	-	ACEC Expansion	7,745
Beaver Rim	Fish and wildlife, plant communities, scenic values, geologic features, paleontological	ACEC	6,421	ACEC Expansion	20,532	No ACEC	-	ACEC	6,421
Green Mountain	Wildlife, plant communities	ACEC	14,612	ACEC Expansion	24,860	No ACEC	-	ACEC Expansion	21,389
South Pass Historic Mining Area	Hazards, cultural	ACEC	12,576	ACEC Expansion	23,439	No ACEC	-	No ACEC	-
South Pass Historical Landscape ²	Hazards, cultural	No ACEC	-	No ACEC	-	No ACEC	-	ACEC	124,229
National Historic Trails	Scenic values, cultural	ACEC	27,728	ACEC Expansion	468,183	No ACEC	-	No ACEC	-

ACEC Name	Value(s) of Concern	Alternative A		Alternative B		Alternative C		Alternative D	
		Existing Designation	BLM Surface (Acres)	Proposed Designation	BLM Surface (Acres) ¹	Proposed Designation	BLM Surface (Acres)	Proposed Designation	BLM Surface (Acres)
Continental Divide National Scenic Trail	Scenic values	No ACEC	-	Proposed ACEC	259,380	No ACEC	-	No ACEC	-
Cedar Ridge	Cultural	No ACEC	-	Proposed ACEC	7,039	No ACEC	-	No ACEC	-
Castle Gardens	Cultural	No ACEC	-	Proposed ACEC	8,469	No ACEC	-	No ACEC	-
Sweetwater Rocks	Scenic values, geologic features, cultural	No ACEC	-	Proposed ACEC	152,347	No ACEC	-	No ACEC	-
Regional Historic Trails and Early Highways	Cultural	No ACEC	-	Proposed ACEC	89,016	No ACEC	-	No ACEC	-
Government Draw/Upper Sweetwater Sage-Grouse	Wildlife	No ACEC	-	Proposed ACEC	1,246,791	No ACEC	-	No ACEC	-
Twin Creek ³	Wildlife	No ACEC	-	No ACEC	-	No ACEC	-	Proposed ACEC	35,102
Source: BLM 2012a ¹ Acreage of ACEC Expansion includes the existing plus the proposed expansion acreage. ² The existing South Pass Historic Mining Area ACEC is contained within the area proposed as the South Pass Historical Landscape ACEC under Alternative D. ³ The proposed Twin Creek ACEC designated under Alternative D is contained within the area proposed as the Government Draw/Upper Sweetwater Sage-Grouse ACEC under Alternative B. ACEC Area of Critical Environmental Concern BLM Bureau of Land Management									

Restrictions on resource uses (e.g., closed to mineral leasing) apply throughout the life of the RMP, unless changed through a RMP amendment. Category restrictions, which are referred to throughout the remainder of this chapter, define the restrictions applied to mineral and realty actions such as oil and gas leasing, locatable mineral entry, and wind energy or ROW authorizations. The six categories represent a range of restrictions associated with mineral and realty actions, with Category 1 being the least restrictive and Category 6 the most restrictive. An area managed with a Category 1 restriction is open to all mineral and realty actions subject to standard stipulations, while an area managed with a Category 6 restriction is closed or excluded to all mineral and realty actions. The intermediate categories (categories 2 through 5) apply varying levels of restrictions such as avoidance for wind energy and ROW authorizations and seasonal and/or CSU restrictions for mineral leasing. Many management actions include a Category restriction to indicate the types of actions allowed in a certain area. Table 2.6, “Category Restrictions Key” (p. 73) provides a description of each Category restriction.

Management actions developed under all alternatives are subject to valid existing rights. In addition, management actions may only be implemented when consistent with applicable laws, regulations, and policies. Changes in resource use restrictions and a resulting RMP amendment can result due to public demand, statewide or national policy and guidance, or other factors. The timing and degree of implementation of management prescriptions in this RMP and EIS depend on available budget, staffing, and agency priorities. Actions the BLM takes or authorizes during RMP implementation would comply with standard practices, BMPs, guidelines for surface-disturbing activities, and other BLM guidance and policy. Therefore, the BLM considers these practices and guidelines as part of each alternative. Implementation of new BLM policy and guidance during the life of this RMP will be incorporated into the land use planning process and implementation level decisions.

The lack of detailed, implementation level decisions in the land use planning process prohibits the development of specific, detailed mitigation measures. As appropriate, the BLM will perform additional environmental analyses during the implementation stage for site-specific actions and will determine on a case-by-case basis what, if any, mitigation is required.

2.9.1. Alternative A (Current Management)

2.9.1.1. Overview of the Alternative

Alternative A represents the current management of resources on BLM-administered surface and mineral estate within the planning area under the existing plan.

2.9.1.2. Physical Resources

Under Alternative A, the BLM manages physical resources to conserve air, water, and soil resources and to support resources and resource uses. Alternative A places limitations on surface-disturbing activities to protect soil resources by prohibiting surface disturbance on slopes greater than 25 percent, but allows soil-disturbing activities in areas with **limited** reclamation potential (LRP). Soil reclamation management under Alternative A requires soil stabilization and sediment control in compliance with Wyoming Stormwater Discharge requirements and, on a case-by-case basis, requires seeding of a cover crop to protect topsoil. To conserve water resources within the planning area, the BLM prohibits or avoids surface-disturbing activities in groundwater recharge areas on a case-by-case basis; limits restrictions on pesticide use in aquifer recharge

areas to label instructions; and, in cooperation with stakeholders, implements management actions to prevent degradation of groundwater and surface water quality. Alternative A does not identify special management prescriptions for any lands with wilderness characteristics.

2.9.1.3. Mineral Resources

The BLM manages mineral resource uses by identifying BLM-administered lands and federal mineral estate within the planning area suitable for exploration and development of leasable, locatable, and salable minerals. Management actions also seek to protect other resource values that are incompatible with mineral resources activity. Approximately 23,114 acres are withdrawn from locatable mineral entry in the planning area and 2,777,334 acres are open to locatable mineral entry.

Alternative A closes approximately 25,136 acres of federal mineral estate in the planning area to oil and gas leasing and opens the remaining federal mineral estate in the planning area for oil and gas leasing, subject to the following constraints: 731,144 acres are subject to standard lease stipulations, 1,715,341 acres are subject to moderate constraints, and 337,481 acres are subject to major constraints. No lands are identified for leasing under an MLP. The BLM identifies constraints on mineral leasing in the planning area to protect resource values. Major constraints include more stringent restrictions on oil and gas development, such as NSO restrictions or overlapping timing limitation stipulation (TLS) restrictions, and usually occur in areas with more sensitive resource values. Moderate constraints apply less restriction on development and usually limit the time of construction and operation activities or require specific mitigation or lease stipulations. Standard stipulations subject oil and gas leasing to the terms and conditions of the standard lease form only.

Table 2.4, “Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area” (p. 45) displays the acres of mineral estate available for geothermal and other leasable minerals development.

Disposal of mineral materials under Alternative A is available on a demand basis in areas with Category 1 or 2 restrictions.

2.9.1.4. Fire and Fuels Management

Under Alternative A for fire and fuels management, full suppression is the most likely fire suppression strategy, with other suppression strategies used on a case-by-case basis. The aerial application of fire retardants is prohibited within 300 feet of any waterbody. The appropriate response to wildland fire is based on the circumstances under which a fire occurs and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and other values to be protected.

Approximately 6,000 acres of fuels reduction and vegetation treatments over 20 years are expected to occur under Alternatives A. Reactive fire management (fire suppression and rehabilitation) is typically more expensive, time consuming, and damaging than proactive fire, fuels, and vegetation management (prescribed burns, mechanical thinning, chemical treatment, and subsequent restoration). The projected fire suppression cost would be along historical trends.

2.9.1.5. Biological Resources

The BLM manages biological resources under Alternative A to provide habitat for fish and wildlife, meet public demand for forest products, protect natural functions in riparian-wetland areas, and control the spread of invasive species. Although the 1987 RMP originally analyzed vegetative resources as a subpart of livestock grazing, the adoption of the Wyoming Standards for Healthy Rangelands in 1997 made vegetative health a consideration in every activity and allows resource use only that supports Wyoming Standards for Healthy Rangelands. Vegetative treatments would be utilized to manage vegetative communities to increase forage production while maintaining healthy rangeland ecosystems. Management of forests and woodlands would continue to emphasize forest health, wildlife habitat, and demand for forest products, allowing clear-cuts of 25 acres or smaller. Various site-specific management actions would be utilized to make progress towards meeting PFC including fencing, resting, deferment, and road closures of riparian-wetland areas within the planning area. Surface-disturbing activities within 500 feet of surface water would be prohibited. For invasive species and pest management, Alternative A manages activities that contribute to the spread of invasive plant species on a case-by-case basis.

The BLM primarily manages potential impacts to fish and wildlife species and their habitats on a case-by-case basis, such as avoiding road construction in big game crucial winter range or reducing the footprint of surface-disturbing activities and facilities. Constraints on resource uses specifically protect fish and wildlife resources in only a few cases under Alternative A. Specific constraints are primarily seasonal limitations on surface-disturbing activities to protect wildlife during important times of the year, such as winter and birthing periods. For example, surface-disturbing activities are prohibited within $\frac{3}{4}$ mile of active raptor nests from February 1 to July 31 and within elk winter range from November 15 to April 30.

The BLM manages impacts to special status species and their habitats in compliance with the ESA and BLM policy for special status species, including BLM sensitive species. Alternative A has specific protections for greater sage-grouse, such as prohibiting surface-disturbing activities within $\frac{1}{4}$ mile of occupied greater sage-grouse leks and avoiding surface disturbance in greater sage-grouse nesting habitat within 2 miles of occupied leks from February 1 to July 31, but does not adopt the Wyoming Governor's Core Area strategy. For the majority of special status species, management is directed at avoiding or minimizing impacts from surface disturbance and disruptive activities on a case-by-case basis. For example, Alternative A requires, on a case-by-case basis, anti-perching devices on overhead powerlines and limitations on activities that contribute sediment to waterbodies supporting Yellowstone cutthroat trout, burbot, and sauger.

Management actions for wild horses include considering the impacts on herd health when making management decisions regarding fencing. The BLM does not establish scenic loops for wild horse viewing under Alternative A.

2.9.1.6. Heritage and Visual Resources

Alternative A **partially** balances the protection of cultural resources with impacts to them, and the BLM attempts to limit effects to cultural resources on a case-by-case basis. For development-related effects, Alternative A has mostly standard measures to protect significant prehistoric, historic, and sacred, spiritual, and/or traditional cultural properties. However, standard protection measures mostly do not address management of historic settings along historic trails and certain historic sites, so protection has been sporadic. The same is true for sacred, spiritual, and/or traditional cultural properties. For natural deterioration and looting/vandalism types of

effects upon cultural resources, Alternative A addresses effects to some specific cultural resource properties, but does not cover effects to unnamed cultural resources. As a result, protection from deterioration and looting/vandalism has been only occasional. For location-specific cultural resource management actions, Alternative A protects 557 acres of the Warm Springs Canyon Flume site. Alternative A has minimal protections for other location-specific resources, such as sacred, spiritual, and/or traditional cultural properties, due to a lack of management direction.

For paleontological resources, Alternative A also partially balances protection with impacts and strives to limit effects on a case-by-case basis. For development-related effects, new paleontological laws and regulations have strengthened the protection of fossil resources, especially in areas of “very high” and “high” potential. However, Alternative A does not address impacts to paleontological resources from natural deterioration and looting/vandalism. For location-specific paleontological resource management actions, Alternative A restricts resource uses to protect the Beaver Rim proposed National Natural Landmark (NNL). For other location-specific resources such as the Bison Basin proposed NNL, and the Bonneville to Lost Cabin, Lander Slope, and Gas Hills high potential paleontological areas, Alternative A has minimal protections.

Under the existing plan, the BLM categorized the management of visual resources in accordance with five VRM classes, each of which provide different levels of management and protection for visual resources. VRM Class V visual resources no longer exist as a class objective and are therefore managed as Class IV under Alternative A. The majority of BLM-administered land under Alternative A is managed as VRM Class IV (1,853,862 acres), which provides for management activities that allow major modification to the existing character of the landscape. The level of change to the characteristic landscape in VRM Class IV areas can be high. The remainder of BLM-administered surface in the planning area is managed as Class I, II, and III, which retain more of the existing character of the landscape.

2.9.1.7. Land Resources

Land resource program actions under Alternative A identify approximately 2,385,637 acres for retention within the planning area and approximately 8,573 acres as available for disposal. Some of these lands would not meet current guidance for disposal and have been removed from the acreage in the other alternatives. Lands identified for disposal are generally small areas (less than 40 acres) and are usually isolated tracts, making them difficult for the BLM to manage. The BLM opens a total of 2,113,512 acres to wind-energy development and manages 64,816 acres as avoidance areas and 215,882 acres as exclusion areas for wind-energy development. This acreage is based upon a ¼-mile buffer around the Congressionally Designated Trails. Under Alternative A, no corridors have been designated for ROWs; therefore, major ROWs are concentrated in existing utility corridors as much as possible. Communication facilities are authorized on a case-by-case basis.

Trails and travel management under Alternative A balances resource protection with access and recreational values. For example, the BLM closes the Lander Slope, Red Canyon, Whiskey Mountain, and portions of Green Mountain areas to motorized travel from December 1 to June 15 to protect sensitive resources. The Dubois Badlands ACEC and Castle Gardens area are closed to motorized travel year-round. Unless otherwise specified, the BLM limits motorized vehicle use to existing roads and trails within the planning area (2,226,504 acres), which prohibits cross-country motorized travel but is less restrictive than limiting travel to designated roads

and trails. Over-snow vehicle travel is prohibited only in the Red Canyon area and is open in the remainder of the planning area.

Alternative A permits livestock grazing on 2,324,934 acres in the planning area. The alternative opens acquired lands for livestock grazing on a case-by-case basis and prohibits the placement of salt and mineral supplements within ¼ mile of water and riparian-wetland areas. The BLM establishes forage utilization levels for livestock and allows new infrastructure types of range improvements on a case-by-case basis. Fences and cattleguards may be removed or modified on a case-by-case basis to allow movement of wildlife, wild horses, and livestock.

Recreation management under Alternative A provides restrictions to protect recreation resources primarily at the developed site level while few restrictions exist to protect other important recreation areas. Under Alternative A, the BLM manages three SRMAs to protect the recreation setting and provide for specific recreation opportunities such as hiking or biking. Alternative A also designates 12 ERMAs which provide less structured recreation opportunities than SRMAs but are used to specifically address local recreation issues. Those lands not included in separate ERMAs or SRMAs are managed as part of the Lander ERMA (1,824,406 acres). See Appendix C (p. 1453) for a detailed discussion of recreation management areas by alternative.

2.9.1.8. Special Designations

Currently, the BLM manages nine ACECs: Lander Slope, Red Canyon, Dubois Badlands, Whiskey Mountains, East Fork, Beaver Rim, Green Mountain, NHTs, and South Pass Historic Mining District. Table 2.5, “Comparative Summary of Areas of Critical Environmental Concern by Alternative” (p. 50) summarizes acreage and management emphasis in each of these ACECs.

In addition to the provisions of BLM Manual 6330, *Management of Wilderness Study Areas*, which in 2012 replaced the Interim Management Policy and Guidelines for Lands Under Wilderness Review (BLM 1995), Alternative A places strict limitations on motorized travel within WSAs by limiting motorized travel in seven of the eight WSAs in the planning area to designated roads and trails that existed and were identified before or during the inventory phase of the Wilderness review. The remaining WSA, the Dubois Badlands, is closed to motorized travel. The BLM manages all WSAs as separate ERMAs to address local recreation issues.

The BLM also manages nine waterway segments that are eligible for inclusion in the National Wild and Scenic River System (NWSRS) for outstanding remarkable values (ORVs) and tentative classification: Baldwin Creek Unit (8.1 miles), Sweetwater River Unit (12.9 miles), Ice Slough (1.6 miles), Little Popo Agie River (1.5 miles), North Popo Agie River (0.7 miles), Rock Creek (4.0 miles), Warm Springs Creek (1.3 miles), Willow Creek (1.3 miles), and Wind River (0.5 miles).

Under Alternative A, the BLM manages two Congressionally Designated Trails. The entire Continental Divide National Scenic Trail (CDNST) is included in a SRMA, but no allowable use decisions exist for the area. For NHTs, the BLM manages mineral and realty actions with Category 4 restrictions within ¼ mile of each side of the trails but also applies specific Category restrictions to certain trail sections. The BLM manages NHTs as VRM Classes I and II, only authorizing highly visible projects on a case-by-case basis in order to protect the NHTs from visual intrusions. As noted above, the BLM manages the Oregon, Mormon Pioneer, California, and Pony Express NHTs as an ACEC under Alternative A, the areal extent of which is defined as the area within ¼ mile of each side of the NHTs.

2.9.1.9. Socioeconomic Resources

The BLM's management includes analyzing impacts on socioeconomic resources from the implementation of projects through the NEPA process.

2.9.2. Alternative B

2.9.2.1. Overview of the Alternative

Alternative B emphasizes conservation of physical, biological, heritage and visual resources when managing the public lands for multiple use. Land uses would still be authorized, but greater restrictions would be placed on where and how they occur. Alternative B utilizes a low impact approach to resource management, utilizing natural systems to achieve goals and objectives, particularly achieving Wyoming Standards for Healthy Rangelands, PFC, and forest health, and employing the least infrastructure and human presence as possible. There would be little to no infrastructure range improvements and a correspondingly higher amount of vegetation treatments. In order to avoid potential lasting impacts from more intense management actions, making improvements to resource condition may take longer to achieve than a more development-oriented approach. Compared to other alternatives, Alternative B would preserve the most land area for physical, biological, and heritage resources; would designate the highest number of ACECs; and would be the most restrictive to motorized travel and mineral development. Alternative B adheres to all BLM policies related to greater sage-grouse, incorporates conservation measures from the NTT report, and manages greater sage-grouse breeding, nesting, and brooding areas either consistent with or more restrictive than the Wyoming Governor's Core Area strategy.

2.9.2.2. Physical Resources

Under Alternative B, the BLM manages physical resources with an emphasis on conserving these resources. This alternative is less focused on supporting resource uses than the other alternatives. Alternative B places more limitations on surface-disturbing activities to protect soil resources than the other alternatives. For example, Alternative B avoids surface disturbance on slopes greater than 15 percent and prohibits soil disturbance in areas with LRP. Reclamation standards are also more stringent than the other alternatives. Management under Alternative B includes more proactive management protections for surface and groundwater resources including avoiding surface disturbance and prohibiting pesticide use in known or inferred aquifer recharge areas.

Unlike alternatives A and C, Alternative B identifies special management prescriptions for certain lands with wilderness characteristics, including the Little Red Creek Complex.

2.9.2.3. Mineral Resources

Mineral resource uses are subject to additional constraints under Alternative B compared to other alternatives (see Table 2.4, "Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area" (p. 45)). Within the planning area, 1,167,862 acres are available for locatable mineral entry, while 1,632,605 acres are recommended for withdrawal from mineral entry.

Alternative B closes approximately 2,279,525 acres of federal mineral estate to oil and gas leasing and opens the remaining federal mineral estate to oil and gas leasing subject to the following

constraints: 32,952 acres are subject to standard lease stipulations, 309,100 acres are subject to moderate constraints, and 187,524 acres are subject to major constraints. Although lands were identified by external nominations as appropriate for leasing subject to an MLP analysis, all were located in the 2,279,525 acres that are closed to leasing entirely. While it is possible that more refined or focused approaches under an MLP analysis could have reduced the acreage that would be closed under Alternative B because of resource conflicts, analyzing the more severe constraint was reasonable and provided a complete range of alternatives.

Table 2.4, “Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area” (p. 45) displays the acres of mineral estate available for geothermal and other leasable minerals.

For salable minerals, approximately 209,842 acres are open to disposal with Category 1 or 2 restrictions, while 2,599,259 acres with Category 3 to 6 restrictions are closed to mineral material disposal.

2.9.2.4. Fire and Fuels Management

Fire and fuels management actions under Alternative B include using full suppression of wildland fire within the wildland-urban interface (WUI) and where necessary to minimize critical resource damage. The aerial application of fire retardant is prohibited within ¼ mile of waterbodies that support certain special status fish species. Full suppression will be applied if needed to protect greater sage-grouse habitat including the approximately 70 percent of the BLM-administered surface that is located in the Wyoming Governor's Core Area. As with Alternative A, the appropriate response to wildland fire would be based on the circumstances under which a fire occurs and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and other values to be protected.

Alternative B assumes 20,000 acres of fuels treatment over 20 years, or more than triple the acres projected for Alternative A. More acres of strategic fuels treatment will lead to reduced fire suppression costs in areas adjacent to WUI or public infrastructure in comparison to alternatives A and C. Some moderation of the suppression costs would be achieved with this alternative due to the emphasis on the management of natural ignitions for resources benefits, but that benefit would be limited to those areas outside of Core Area or where Core Area annual precipitation exceeds 12 inches.

2.9.2.5. Biological Resources

Biological resources management under Alternative B places more emphasis on conservation of habitat for fish and wildlife, ecosystem management, protection of natural functions in riparian-wetland areas, and control of invasive species compared to Alternative A. Vegetative communities under Alternative B would be managed to benefit biological diversity of wildlife, fish and special status species. Treatments would be done to restore diversity of ecological sites and their transitional states within these sites. Management of forests and woodlands would emphasize the improvement of vegetative health and would prohibit clear-cuts and harvest methods that create clear-cuts. The BLM would use the natural healing capacity of the land to make progress towards meeting PFC, using management actions such as road closures and livestock grazing management. Surface-disturbing activities would be prohibited within 1,320 feet of surface water and riparian-wetland areas. Invasive species and pest management would be similar to Alternative A but with extra precautions designed to minimize the spread of invasive

species. An Authorized Officer may adjust the terms of an authorized activity if it is determined the activity is contributing to the spread of noxious or invasive species.

Alternative B places a greater emphasis on the conservation of habitat for fish and wildlife and places more constraints on resource uses that affect biological resources compared to Alternative A. For example, Alternative B prohibits surface-disturbing activities within 1½ miles of active raptor nests during species specific nesting periods and, in all cases, requires minimizing the footprint of surface-disturbing activities to the smallest practical to protect wildlife and their habitats. Similar to Alternative A, Alternative B prohibits surface-disturbing activities within identified elk winter range from November 15 to April 30.

Special status species receive increased protection under Alternative B through larger protective buffers, timing stipulations, and other constraints on resource uses. Alternative B extends the protective buffer around greater sage-grouse leks from ¼ mile under Alternative A to 0.6 mile, and limits surface disturbance in greater sage-grouse nesting habitat within 3 miles of occupied leks from February 1 to July 31. Wind-energy development and oil and gas leasing are closed in the Wyoming Governor's Core Area and surface disturbance is cap at 2.5 percent and 1 energy development in 640 acres. Livestock water developments are not allowed in greater sage-grouse nesting areas. To protect special status plants, Alternative B does not allow chemical vegetation treatments within ¼ mile of habitat for BLM sensitive plant species and closes areas with special status plant populations to motorized and mechanized travel. Alternative B preserves traditional migration and travel corridors for all special status species, and, to protect special status fish populations, does not authorize activities that could contribute sediment to waterbodies that support Yellowstone cutthroat trout, burbot, and sauger.

Management of wild horses under Alternative B allows more opportunity for wild horse viewing by the public compared to Alternative A through the establishment of scenic loops. Alternative B also calls for the removal or modification of existing fences to allow free movement among herd populations.

2.9.2.6. Heritage and Visual Resources

Alternative B provides increased protection for heritage resources through constraints on resource uses and proactive management to identify important cultural or paleontological sites. Under Alternative B, the BLM conducts assessments in areas where cultural and paleontological resources are threatened by development and prioritizes endangered sites for additional protections. The BLM also manages a larger area, compared to Alternative A, around the Warm Springs Canyon Flume site (834 acres) to protect the area as a National Register of Historic Places (NRHP)-eligible property. Alternative B manages the Beaver Rim NNL and proposed Bison Basin NNL with greater protection; mineral and realty actions within these areas are managed with restrictions on all mineral and realty actions except locatable minerals. Additionally, Alternative B increases the protection for the sacred, spiritual, and/or traditional cultural properties by managing these areas with surface restrictions and avoidance within 3 miles. As under Alternative A, the BLM conducts inventories for paleontological resources in areas having a “very high” or “high” Potential Fossil Yield Classification prior to all surface-disturbing activities, but also pursues more detailed analysis of the planning area to further identify areas of high potential for significant paleontological resources.

Under Alternative B, the BLM places a greater emphasis on protecting visual resources and preserving the character of the landscape. Over 50 percent of BLM-administered land in the

planning area is managed as VRM Class II (1,284,122 acres) which seeks to retain the existing character of the landscape by limiting surface disturbance. Alternative B allows fewer visual intrusions than Alternative A by limiting VRM Class IV visual resources (756,813 acres) to existing oil and gas fields and around large open pit mines.

2.9.2.7. Land Resources

Land resource program actions under Alternative B identify approximately 2,388,774 acres for retention within the planning area, slightly more than under Alternative A, and approximately 5,436 acres as available for disposal. The BLM opens a total of 41,372 acres to wind-energy development and manages 23,887 acres as avoidance areas and 2,328,951 acres as exclusion areas for wind-energy development. Alternative B establishes ROW corridors which would allow major ROWs to remain in areas of existing disturbance to the greatest extent possible. Communication facilities would be required to be co-located with existing sites. At their expiration, existing ROW grants would be reviewed with appropriate NEPA analysis.

Trails and travel management under Alternative B places a greater emphasis on the protection of other resource values and, therefore, places more limitations on motorized and mechanized travel. For example, the BLM limits motorized and mechanized travel in the Lander Slope, Red Canyon, Whiskey Mountain, and Green Mountain areas to designated roads and trails to protect sensitive resources. Alternative B also closes more acres to motorized and mechanized travel within the planning area and limits motorized travel to existing roads and trails on fewer acres (2,128,741 acres) than Alternative A. Alternative B closes more acres to over-snow travel than Alternative A but still allows over-snow vehicle travel on 2,213,037 acres within the planning area.

Alternative B places more restrictions on livestock grazing compared to Alternative A, opening a total of 2,312,095 acres to livestock grazing and closing 12,839 acres to grazing. Progress towards rangeland health will be achieved by reducing livestock AUMs as monitoring shows that resource conflicts exist. Over time, livestock grazing is likely to be reduced by as much as 60 percent or more, depending upon resource conflicts. Alternative B approaches making progress towards meeting Wyoming Standards for Healthy Rangelands without the use of infrastructure development such as fencing and water developments. Instead, as monitoring conditions reflect a need for change, other livestock grazing management tools will be used to achieve Wyoming Standards for Healthy Rangelands such as reduction in use or change of season of use. Acquired lands under Alternative B are not available to livestock grazing and Alternative B prohibits the placement of salt and mineral supplements within ½ mile of water, within 0.6 mile of greater sage-grouse leks, on areas being reclaimed, and within 3 miles of NHTs. On an allotment-by-allotment basis, the BLM establishes livestock use that would not exceed light utilization in areas preferred by livestock in order to leave sufficient forage and hiding cover for wildlife.

Alternative B places a priority on natural landscapes and the use of livestock grazing as the primary tool to meet natural resource objectives, related to vegetation, wildlife and aesthetics. Range improvement projects would only be employed when they offer no conflict with any other values. Range betterment funds would go primarily to weed abatement and other types of vegetation treatment. Harvest efficiency of vegetation would be no more than 25 percent of the total production (pounds per acre) produced, and distance from water and slope (suitability) would be applied to assure that forage resources are carefully managed to achieve rangeland health standards. When and where opportunities exist, fences and cattleguards would be removed and/or modified to accommodate other resource values. This alternative further allows for the

establishment and management of future common forage reserve allotments. The opportunities would be solely voluntary within the planning area or considered on acquired lands.

Under Alternative B, recreation management emphasizes protection of resources and recreational experiences, and includes more restrictions on resource uses than the other alternatives. The recreational experience is directed at a natural setting and low infrastructure development in a way that is compatible with visual, historic, and wildlife resources. This alternative emphasizes nonmotorized recreation and utilizes allowable use decisions to protect important recreation areas as well as existing and new facilities. For example, Alternative B manages mineral and realty actions within developed recreation sites with the most stringent category restrictions (Category 6), making these areas off limits to mineral entry, leasing, and other realty actions. Alternative B also supports and provides seasonal use stipulations as well as other allowable use decisions to protect several WGFD hunt units managed under special management criteria. Alternative B maintains seven SRMAs and 13 ERMAs. The Lander Slope SRMA is managed in three recreation management zones (RMZs), which are managed for distinctly different recreation products. Each RMZ has certain defining characteristics such as a recreation niche and setting character designed to meet the strategically targeted primary recreation market demand. For example, the Sinks Canyon Climbing RMZ is designed to support muscle-powered recreationists to engage in climbing and hiking. Similarly, Alternative B manages two RMZs within each the CDNST and NHT Destination SRMAs. The BLM manages those lands not included in separate ERMAs or SRMAs as part of the Lander ERMA (1,287,636 acres). See Appendix C (p. 1453) for a detailed discussion of recreation management areas by alternative.

2.9.2.8. Special Designations

Alternative B designates the most land area for special designations and applies the most stringent restrictions on other resource uses in the areas. Alternative B includes 15 ACECs – the nine existing areas (five of which the BLM proposes for expansion), and six new ACECs. The five existing ACECs the BLM proposes to expand are East Fork, Beaver Rim, Green Mountain, NHTs, and South Pass Historic Mining Area. The six new proposed ACECs are Castle Gardens, Cedar Ridge, Government Draw/Upper Sweetwater Sage-Grouse, Sweetwater Rocks, CDNST, and Regional Historic Trails and Early Highways. Table 2.5, “Comparative Summary of Areas of Critical Environmental Concern by Alternative” (p. 50) summarizes acreage and management emphasis in each of these ACECs.

Alternative B places stricter limitations on activities within WSAs to protect wilderness characteristics, including closing all eight WSAs to motorized and mechanized travel.

Management of WSR eligible waterways is similar to Alternative A except that all nine waterways are recommended as suitable for inclusion in the NWSRS and are managed to maintain and enhance ORVs.

Under Alternative B, the BLM manages 82,778 acres of the CDNST as an SRMA and 4,589 acres as a separate ERMA to specifically address local recreation issues. A portion of the CDNST is also managed as a 259,380-acre ACEC with Category 4 restrictions. Alternative B manages mineral and realty actions within 5 miles of each side of NHTs with Category 6 restrictions. To protect the scenic character of the NHTs and associated landscape, Alternative B manages the NHTs as VRM Class II within 15 miles of the trails and as VRM Class III at all designated NHT crossings.

2.9.2.9. Socioeconomic Resources

Under Alternative B, the BLM seeks to actively minimize adverse socioeconomic impacts associated with permitted actions. The BLM's approach to socioeconomic resources is more proactive than the other alternatives and considers paced development options for mineral development to avoid adverse impacts on socioeconomic conditions.

2.9.3. Alternative C

2.9.3.1. Overview of the Alternative

Alternative C emphasizes resource uses and reduces constraints placed on resource uses to protect physical, biological, heritage, and visual resources. Alternative C gives priority to land uses such as oil and gas development, mining, ROWs, and livestock grazing when managing the public lands for multiple use. Fewer restrictions protecting biological, physical, heritage and visual resources would be placed on surface-disturbing and disruptive activities to facilitate land uses and development. Compared to other alternatives, Alternative C would preserve the least land area for physical, biological, and heritage resources and is the least restrictive to motorized vehicle use and mineral development. Alternative C uses all management actions to achieve maximum resource utilization even if a heavier human presence results.

2.9.3.2. Physical Resources

Under Alternative C, the BLM generally manages physical resources similar to Alternative A, but with instances of less stringent management restrictions. Reclamation management is focused primarily on stabilizing soils and establishing ground cover sufficient to reduce and/or prevent accelerated soil erosion and invasive plant species infestation. While Alternative C does not prohibit surface-disturbing activities in known or inferred groundwater recharge areas, it requires the implementation of BMPs to prevent contamination. Alternative C does not separately manage any lands with wilderness characteristics for naturalness and outstanding opportunities for solitude or primitive and unconfined recreation.

2.9.3.3. Mineral Resources

Mineral resource uses are subject to the fewest constraints under Alternative C compared to other alternatives (see Table 2.4, "Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area" (p. 45)). Under Alternative C, 2,800,467 acres are available for locatable mineral entry. No new withdrawals from locatable mineral entry are recommended and existing withdrawals would be allowed to expire.

Alternative C closes approximately 78 acres of federal mineral estate to oil and gas leasing in the planning area and opens the remaining federal mineral estate to oil and gas leasing subject to the following constraints: A total of 804,794 acres are subject to standard lease stipulations, 1,755,628 acres are subject to moderate constraints, and 248,601 acres are subject to major constraints. None of the lands identified in internal and external evaluations would be leased subject to an MLP under Alternative C.

Table 2.4, “Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area” (p. 45) displays the acres of mineral estate available for geothermal and other leasable minerals development.

Additionally, 2,620,997 acres are open to mineral material disposal with Category 1 or 2 restrictions, while 188,104 acres with Category 3 to 6 restrictions are closed to mineral material disposal.

2.9.3.4. Fire and Fuels Management

Fire and fuels management under Alternative C places fewer restrictions on suppression tactics than the other alternatives, allowing the full range of management options across the planning area. As with alternatives A and B, the appropriate response to wildland fire would be based on the circumstances under which a fire occurs and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and other values to be protected.

Alternative C projects the same 6,000 acres of fuels and vegetation treatment as Alternative A and would therefore have the same effect on reducing the costs of suppression, which is less than one-third that of Alternative B.

2.9.3.5. Biological Resources

The BLM manages biological resources under Alternative C similarly to Alternative A, but with fewer constraints on resource uses and a greater emphasis on human intervention to achieve management objectives than natural processes. Vegetative communities would be managed to maximize forage production of a given ecological site. The use of soil and vegetative treatments would be implemented to increase forage production when consistent with healthy rangeland ecosystems. Management of forest and woodlands would emphasize using all available treatment methods to maintain and improve forest health and provide forest products. In riparian-wetland areas all tools such as fences, travel management and road construction would be utilized to make progress towards PFC. Surface-disturbing activities would be prohibited within 500 feet of surface water and riparian-wetland areas, unless a lesser distance is shown to provide equivalent protection. Invasive species and pest management under Alternative C is the same as under Alternative A.

Fish and wildlife under Alternative C, in general, receive less protection compared to Alternative A. For example, the BLM prohibits surface-disturbing activities within ½ mile of active raptor nests, compared to ¾ mile under Alternative A. Alternative C does not require the footprint of surface-disturbing activities to be reduced to protect wildlife and their habitat. Surface-disturbing and disruptive activities within identified elk winter range are not subject to seasonal limitations. Wildlife in areas protected as ACECs in Alternative A are not similarly protected in Alternative C since those areas are managed with standard management.

Management of special status species under Alternative C is similar to Alternative A, especially in not adopting the Wyoming Governor's Core Area strategy; however, Alternative C provides fewer protections for these species. For example, Alternative C allows chemical vegetation treatment within identified habitat for BLM sensitive plant species unless treatment would result in direct mortality of the plant population. Alternative C also allows surface-disturbing activities in areas with special status plant populations unless the activity would result in the loss of the population. Similar to Alternative A, Alternative C prohibits surface disturbance within ¼ mile of greater

sage-grouse leks and limits disruptive activities in greater sage-grouse nesting habitats within 2 miles of occupied leks from February 1 to July 31. The BLM allows authorized activities that could contribute sediment to waterbodies that support Yellowstone cutthroat trout, burbot, and sauger unless it is determined that additional sediment would result in species mortality.

Alternative C establishes scenic loops for viewing wild horses and, similar to Alternative A, considers the impacts on herd health when making management decisions regarding fencing. However, Alternative C allows greater adverse impacts to wild horses as a result of greater use of fences to benefit livestock grazing.

2.9.3.6. Heritage and Visual Resources

Alternative C protects heritage resources similarly to Alternative A. Differences include: Alternative C imposes the minimum restrictions required by regulation on activities that could cause adverse effects to NRHP-eligible properties; manages mineral and realty actions in the Warm Springs Canyon Flume site with Category 1 restrictions as opposed to Category 5 restrictions under Alternative A; and does not identify special management prescriptions for the Beaver Rim and Bison Basin areas.

The BLM manages visual resources under Alternative C in similar fashion to Alternative A, although less acreage is allocated as either VRM Class I or II under Alternative C. Over 95 percent of BLM-administered land in the planning area is managed as VRM Class IV (1,590,758 acres) and Class III (722,356 acres), which allow for moderate to major changes to the characteristic landscape.

2.9.3.7. Land Resources

Land resource program actions under Alternative C identify approximately 2,388,774 acres for retention within the planning area, and approximately 5,436 acres as available for disposal as does Alternative B. The BLM opens a total of 2,284,235 acres to wind-energy development and manages 15,818 acres as avoidance areas and 94,157 acres as exclusion areas for wind-energy development. This alternative establishes ROW corridors with a maximum width of 3 miles. Similar to Alternative A, communication facilities are authorized on a case-by-case basis.

Trails and travel management under Alternative C is similar to Alternative A, but with less restriction on travel. There are no seasonal travel stipulations under Alternative C and fewer acres are closed to motorized travel within the planning area compared to Alternative A. Alternative C limits more acreage to existing roads and trails (2,337,958 acres) than Alternative A and does not close any area to over-snow vehicle travel.

Alternative C emphasizes infrastructure projects and grazing management strategies that promote higher AUM usage as the preferred means to meet the Wyoming Standards for Healthy Rangelands. The planning area is open to livestock grazing on the same acreage as Alternative A. Acquired lands are available for livestock grazing and salt and mineral supplements are prohibited within ¼ mile of water and riparian-wetland areas. Similar to Alternative A, the BLM establishes livestock use that would not exceed moderate utilization in areas preferred by livestock.

Alternative C emphasizes the implementation of a rigorous range improvement program at the landscape level. Installing range improvement projects such as fences, water developments and vegetative treatments would make almost the entire planning area usable by livestock. There are,

however, small areas that would not be suitable for additional water development because the federal lands are too small size or with scattered parcels to develop water. Under Alternative C, range improvement infrastructure and non-infrastructure projects would be installed in all areas possible where mitigation to other resource values would be considered while achieving rangeland health. Weed eradication and vegetation treatment be a minor part of range improvement projects. A harvest efficiency of total vegetative production could be increased to 28 percent as grazing management would be accomplished over most of the planning area. Further, fences and cattleguards would be modified or removed to facilitate improved livestock management on the landscape. Common forage reserve allotments would not be established and flexibility in providing alternative pasture for permittees and lessees would not occur.

Alternative C focuses on dispersed recreation experience with little concern for setting and places few constraints to preserve recreational experiences. Facilities and visitor services would be removed and relocated to accommodate resource uses under this alternative. This alternative does not establish allowable use stipulations on other resource uses to protect the recreation resource. Within developed recreation sites, the BLM manages mineral and realty actions with only standard stipulations. Overall, the BLM conducts little proactive management, primarily ensuring that recreation does not conflict with other resource uses and protecting human health and safety. This alternative recognizes one SRMA and manages 14 ERMA to specifically address local recreation issues. The BLM manages those lands not included in separate ERMA or SRMA as part of the Lander ERMA (1,492,351 acres). See Appendix C (p. 1453) for a detailed discussion of recreation management areas by alternative.

2.9.3.8. Special Designations

The BLM retains no existing ACECs and proposes no new ACECs under Alternative C.

Alternative C also does not recommend any of the nine eligible WSR segments as suitable for inclusion in the NWSRS. Management of these areas would be in accordance with standard management without special protections (Category 1). More mineral activities and realty actions would be allowed.

Management of WSAs is the same as described under Alternative A.

The BLM manages the entire CDNST with a ¼-mile buffer as an ERMA with Category 1 restrictions. Alternative C manages mineral and realty actions within ¼ mile of Condition Class I and II Historic Trail segments with Category 4 restrictions, and authorizes highly visible projects only on a case-by-case basis in order to protect the NHTs from visual intrusions. The BLM manages ¼ mile on either side of the NHTs as VRM Class II.

2.9.3.9. Socioeconomic Resources

Similar to Alternative A, BLM's management under Alternative C includes analyzing impacts on socioeconomic resources from the implementation of projects through the NEPA process. However, Alternative C would also minimize constraints on the pace of development for large development projects.

2.9.4. Alternative D (Proposed RMP)

2.9.4.1. Overview of the Alternative

Alternative D balances the use and conservation of planning area resources. This alternative generally allows resource use if the activity can be conducted in a manner that conserves physical, biological, heritage, and visual resources. Alternative D designates the second most land area as SRMAs and ACECs and emphasizes moderate constraints on resource uses (e.g., mineral development) to reduce impacts to resource values. In areas of high mineral potential, DDAs are established which emphasize mineral use. In Dubois, mineral activities are limited and the area is closed to oil and gas leasing for the protection of special status species and to support destination recreation associated with bighorn sheep. The NTMC is designated to meet the nature and purposes of the Congressionally Designated Trails in a manner that protects the values for which the trails were designated, and recognizes the nationally significant scenic, historic, cultural, recreation, natural, and other landscape values of the public land areas through which the trails pass, and the primary trail use or uses. Protective management, including some areas recommended for withdrawal from locatable mineral entry and oil and gas management with NSO stipulations, is applied across the Lander Front, east to the Hudson area (omitting the Beaver Creek DDA), and south to the Atlantic City area where it meets the NTMC, for the benefit of overlapping wildlife, historic, viewshed, and other values. The Wyoming Governor's Core Area strategy is incorporated into management actions. Protections of winter habitat as well as crucial winter habitat are applied for the benefit of mule deer and elk. An MLP is applied to oil and gas development in the Beaver Rim area.

2.9.4.2. Physical Resources

Under Alternative D, the BLM manages physical resources similar to Alternative A with some increased management restrictions. For example, the BLM prohibits surface-disturbing activities on slopes greater than 25 percent as in Alternative A, but also applies CSU restrictions for slopes between 15 and 24 percent. The BLM would also prioritize areas with soil disturbance that were not successfully reclaimed on a case-by-case basis. Water resources would receive similar protection as under Alternative A, although the BLM places a greater emphasis on protecting aquifers by avoiding surface-disturbing activities with potential to contaminate groundwater in identified or inferred groundwater recharge areas. Alternative D applies more protections for areas with the potential to have groundwater impacted by oil and gas development, although less than under Alternative B, which closes more areas to oil and gas leasing. BMPs are evaluated to be applied as COAs for the protection of groundwater.

Similar to Alternative B, the BLM manages certain lands to protect naturalness and outstanding opportunities for solitude or primitive and unconfined recreation. Alternative D would manage 4,954 acres of the Little Red Creek Complex as non-WSA lands to protect wilderness characteristics.

2.9.4.3. Mineral Resources

Alternative D places more constraints on mineral development than Alternative A. Approximately 2,351,399 acres are available for locatable mineral entry under this alternative. However, Alternative D segregates the Lander Slope and Red Canyon ACECs, lands in the Hudson to

Atlantic City area, greater sage-grouse leks, and the ruts and swales of the NHTs to recommend a locatable mineral withdrawal.

Alternative D closes approximately 166,574 acres of federal mineral estate to oil and gas leasing in the planning area (plus additional acreage associated with Boysen Reservoir that was not included in the reasonable foreseeable development [RFD] scenario for oil and gas). The remaining federal mineral estate is open to oil and gas leasing subject to the following constraints: 44,945 acres are subject to standard lease stipulations, 1,260,715 acres are subject to moderate constraints, and 1,336,867 acres are subject to major constraints (plus additional acreage associated with an NSO in the Green Mountain area that was not included in the RFD scenario for oil and gas).

As described above under *Alternatives Considered but Not Carried Forward for Detailed Analysis*, Alternative D applies an MLP only to the Beaver Rim area (150,782 acres; see Map 135) to reduce resource conflicts. Approximately 29,527 acres within the MLP are open to oil and gas leasing subject to an NSO stipulation and 121,255 acres are open to leasing subject to CSU stipulations. Management within the MLP stipulates other requirements designed to protect resource values where there may be a conflict with oil and gas development, such as requiring watershed monitoring to ensure effectiveness of watershed protections. In the portion of the Green Mountain area that would be part of the expanded ACEC under Alternative B, but not so designated under Alternative D, an NSO stipulation would be applied. This management was not included in the RFD as a major constraint because the management was not identified until after the RFD was finalized, but the area may already be included as a major constraint because of overlapping timing limitations that exceed 6 months.

Table 2.4, “Comparative Summary of Proposed Land Use Decisions in the Lander Planning Area” (p. 45) displays the acres of mineral estate available for geothermal and other leasable minerals. Lands in the Red Canyon and Lander Slope ACECs as well as other lands throughout the planning area are closed to phosphate leasing to protect other resource values, including wildlife and viewsheds.

Additionally, 1,853,090 acres are open to mineral material disposal with surface use restrictions, while 956,011 acres are closed to mineral material disposal.

In contrast to the other alternatives, Alternative D also establishes DDAs to facilitate intensive mineral exploration, development, and production. New fluid and solid mineral leases and mineral material disposals within these areas would be subject to standard stipulations. Exceptions to these stipulations would be authorized through an expedited approval process. Reclamation would be required in accordance with reclamation standards in DDAs identified in Appendix D (p. 1477). In non-DDAs, lease stipulations are extended to identified operations and maintenance actions.

2.9.4.4. Fire and Fuels Management

Fire and fuels management under Alternative D allows for full suppression of wildland fire within the WUI and in areas of high resource values. As with alternatives A, B, and C, the appropriate response to wildland fire would be based on the circumstances under which a fire occurs and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected. Extensive wildlife BMPs are identified, with an emphasis on greater sage-grouse as described in Appendix H (p. 1521).

Fuels and vegetation treatments are expected to be approximately 10,000 acres over 20 years, which is greater than the 6,000 acres under alternatives A and C but half of that under Alternative

B. Therefore, fire suppression costs would be expected to decrease from alternatives A and C but only half as much as under Alternative B.

2.9.4.5. Biological Resources

In some cases, the BLM manages biological resources under Alternative D similarly to Alternative A. Vegetation management supports both resources and resource uses and often requires proactive and case-by-case management to respond to conditions on the ground. For example, Alternative D authorizes clear-cuts and determines their size and location on a combination of resource values and silvicultural objectives. Forest harvesting BMPs are provided. Riparian-wetland management emphasizes a more proactive approach to address watershed health by using a full range of techniques to achieve PFC. Similar to Alternative A, Alternative D prohibits surface-disturbing activities within 500 feet of riparian-wetland areas but would allow such activity in DDAs if a lesser distance is shown to provide equal protection. Invasive species and pest management under Alternative D is the same as under Alternative B.

Fish and wildlife under Alternative D, in general, receive more protection compared to Alternative A, especially within important habitat areas. For example, the BLM prohibits surface-disturbing activities within 1 mile of bald eagle nests and $\frac{3}{4}$ mile of all active raptor nests but additionally increases the buffer to 1 mile for ferruginous hawk nests. Management also emphasizes minimizing the footprint of surface-disturbing activities to the extent practical to protect wildlife and their habitats. Protections for mule deer are stronger than under Alternative A through application of winter stipulations to winter range and migration areas. Some important mule deer habitat is identified for withdrawal from locatable mineral entry and some mule deer habitat is open to oil and gas leasing subject to NSO stipulations.

Similarly, Alternative D provides more protection for special status species than Alternative A, such as increasing the size of protective buffers and limiting incompatible activities near the habitats of these species. For example, Alternative D allows chemical vegetation treatments within identified sensitive plant populations only if the treatment benefits the population. For greater sage-grouse, constraints on resource uses are greater within Core Area than outside Core Area and restrictions are placed on the amount of surface disturbance allowed inside Core Area. Alternative D prohibits surface disturbance within 0.6 mile of greater sage-grouse leks in Core Area and recommends the leks for withdrawal from locatable mineral entry. Lands within $\frac{1}{4}$ mile of leks outside Core Area are closed to surface disturbance. BMPs are identified for evaluation at site-specific analysis to be incorporated as COAs for the protection of wildlife, with a special emphasis on greater sage-grouse. The Dubois area is closed to oil and gas leasing to protect special status species and bighorn sheep related tourism (Map 3).

Alternative D would also avoid activities that contribute sediment to waterbodies containing certain special status fish unless activities will not harm species or adequate mitigations can be applied.

Alternative D establishes scenic loops for viewing wild horses, but limits road improvements to those necessary for public safety and encourages the establishment of remote viewing opportunities. In consideration of herd health, Alternative D allows the removal or modification of fences to allow free movements among herd populations.

2.9.4.6. Heritage and Visual Resources

Alternative D generally increases the protection of cultural and paleontological resources compared to Alternative A by placing more limitations on activities near known cultural and paleontological sites. Alternative D protects the same area in the Warm Springs Canyon Flume site as Alternative A but manages mineral and realty actions in the surrounding area with more stringent Category restrictions. However, protection from development-related effects continues to be managed on a case-by-case basis as under Alternative A. Alternative D's identification of lands for withdrawal from locatable mineral entry is more protective of the cultural resources in those areas than Alternative A. Alternative D does increase proactive inventory efforts compared to Alternative A in areas of significant resources such as in the Gas Hills High potential fossil areas. Both the Beaver Rim and Bison Basin proposed NNL are managed the same as Alternative A.

The BLM manages visual resources under Alternative D in similar fashion to Alternative A, although more acreage is allocated as either VRM Class I or II under Alternative D. Over 66 percent of BLM-administered land in the planning area is managed as VRM Class III (857,979 acres) and Class IV (694,759 acres), which allow for moderate to major changes to the characteristic landscape.

2.9.4.7. Land Resources

Land resource program actions under Alternative D identify approximately 2,386,137 acres for retention within the planning area, and approximately 8,073 acres as available for disposal (plus 6,665 additional acres available for disposal with restrictions on use). Alternative D increases the lands identified for disposal based on recommendations by the public and by the BLM in response to proposed land exchanges, as well as lands to be transferred to the Department of Energy (DOE) for long-term legacy management of uranium mill sites. Alternative D places less restriction on renewable energy development compared to Alternative B, opening 224,289 acres to wind-energy development and managing 1,215,599 acres as avoidance areas and 954,322 acres as exclusion areas for wind-energy development. Alternative D recognizes that until the impacts of wind-energy development to greater sage-grouse are determined, Core Area will be closed to wind energy (although identified on maps as an avoidance area, pending research). Avoidance criteria have been identified and provided in Appendix E (p. 1483). In contrast, Alternative D places more limitations on ROW and corridor management than Alternative A, including managing much more area as ROW avoidance and exclusion areas in which ROW authorizations are restricted. More routes are designated as ROW corridors, primarily for underground ROWs such as CO₂ or oil and gas transport, and to match corridor designations in other field offices.

Alternative D provides for a more comprehensive approach to travel planning, with a particular emphasis on supporting biological resources by placing timing limitations on various modes of travel. Therefore, management is more site-specific than Alternative A and includes travel prescriptions for specific areas. For example, travel is limited to designated roads and trails in portions of the Lander Slope, Red Canyon, Whiskey Mountain, and Green Mountain areas to protect resource values. In areas not identified for site-specific management, however, travel is limited to existing roads and trails, which under Alternative D applies to more area (2,213,081 acres) than Alternative A. This is an interim designation; travel management implementation will identify routes as designated or closed to motorized travel. Alternative D closes more acres to over-snow travel than Alternative A but still allows over-snow vehicle travel on 2,323,785 acres

within the planning area so long as sufficient snow is on the ground to protect on-the-ground resources.

Alternative D increases restrictions on livestock grazing in certain areas for the protection of other resource values compared to Alternative A but also increases proactive management approaches to improve rangeland health. Alternative D opens less land to livestock grazing compared to Alternative A and increases the areas where the placement of salt and mineral supplements is prohibited. Acquired lands are available to livestock grazing on a case-by-case basis. Stocking rates would be established that allow for utilization by livestock, while providing sufficient forage to support wildlife and wild horse populations and to achieve the Wyoming Standards for Healthy Rangelands. Range infrastructure projects would be employed to improve rangeland health but only in consideration of other resource values and with a clear link to a Comprehensive Grazing Strategy. Over time, the number of AUMs authorized would be reduced if needed to meet the Wyoming Standards for Healthy Rangelands based upon monitoring information and rangeland health assessments. Vegetation treatments would rarely be utilized as range improvement projects. Fence marking for the protection of greater sage-grouse would be required and there would be no net gain in fencing in wildlife migration corridors.

Alternative D focuses more on protecting the setting and recreational experience compared to Alternative A. The alternative also places a greater emphasis on nonmotorized recreation and utilizes allowable use decisions to protect important recreation areas. Alternative D increases many of the resource use limitations within certain recreation areas compared to Alternative A to protect the values for which the area was designated. Alternative D maintains seven SRMAs and six ERMAs. Similar to Alternative B, within the Lander Valley, NHT Destination, and CDNST SRMAs, the BLM manages seven RMZs to meet specific recreation market demand. See Appendix C (p. 1453) for a detailed discussion of recreation management areas by alternative. Recreation use near the Congressionally Designated Trails would be managed to support the nature and purpose of the Congressionally Designated Trails.

2.9.4.8. Special Designations

Alternative D designates the lands associated with the landscape, recreation, and setting of the Congressionally Designated Trails as the NTMC with limitations on mineral development, ROWs, realty actions, and other resource uses to protect the nature and purpose of the Congressionally Designated Trails. This management includes the withdrawal of the ruts and swales of the NHTs; ACEC management of the Congressionally Designated Trails as provided by Alternative A would be applied if the withdrawal is not approved.

WSAs in the planning area are managed to improve access while protecting sensitive areas from resource damage. To that end, three WSAs are closed to motorized vehicle use (Dubois Badlands, Copper Mountain, and Whiskey Mountain) while the remaining WSAs are limited to designated roads and trails. Within these limited open areas, travel systems and linear features found to be in conflict with wilderness values may be modified, including closures, to protect these values.

Alternative D identifies three waterways, the Baldwin Creek Unit, Warm Springs Segment 1, and the Sweetwater River Unit, as suitable for inclusion in the NWSRS. Management of these areas is similar to Alternative A although more limitations are placed on activities that could degrade the ORVs of these waterways, including livestock grazing and motorized vehicle use.

The BLM manages eight ACECs, including six existing ACECs, two of which, East Fork and Green Mountain, include expansion areas. Alternative D would also designate the South Pass Historical Landscape ACEC and the Twin Creek ACEC, which is contained in an area identified for withdrawal from locatable mineral entry to protect important wildlife values. Should the withdrawal not be approved, the wildlife values would be protected through management of the Twin Creek ACEC; the NHTs would also be designated as an ACEC as provided in Alternative A. Table 2.5, “Comparative Summary of Areas of Critical Environmental Concern by Alternative” (p. 50) summarizes acreage and management emphasis in each of these ACECs.

Under Alternative D, the BLM manages 82,778 acres of the CDNST as an SRMA and 4,589 acres as a separate ERMA to specifically address local recreation issues. The BLM also designates trails-related land subject to mining impacts as the South Pass Historical Landscape ACEC and trails-related land outside this ACEC as the NTMC associated with the Congressionally Designated Trails. The NTMC is managed as VRM Class II while the designated utility crossings and the CDNST ERMA are VRM Class III. Highly visible projects outside of 5 miles of the NTMC (except within the main Lost Creek utility corridor) are authorized only if the project causes no more than a weak contrast.

Alternative D provides special management for those areas identified as having relevant and important values but not designated as ACECs.

2.9.4.9. Socioeconomic Resources

BLM management under Alternative D emphasizes the continued analysis of impacts on socioeconomic resources and addresses monitoring of economic and social impacts as part of implementation. This alternative would also consider paced development options for mineral development projects in the planning area to avoid adverse impacts to socioeconomic resources. This alternative manages high potential mineral areas to facilitate mineral development and emphasizes recreation as well as heritage and wildlife tourism. Alternative D applies protective measures to important wildlife habitat areas, including those for mule deer, to proactively address potential adverse impacts from mineral development, which, if not properly addressed, could lead to the need for resource protections that could have far more substantial impacts on social and economic interests.

Alternative D emphasizes protections for the areas on the Lander Front and in the Dubois area that are important to the local economies for their visual, recreation, and wildlife values as well as for their importance for recreation and tourism income. The NTMC is managed to support the nature and purposes of the Congressionally Designated Trails and their recreational use. Trail protections are limited to those areas needed for the nature and purpose of the Congressionally Designated Trails and not applied to lands not so needed to avoid unnecessary use limitations.

The economic well-being of the planning area and adjoining communities has been addressed through the designation of ROW corridors, particularly the pipelines necessary to support enhanced oil and gas recovery and the transmission of product. Alternative D applies avoidance management and avoidance criteria so that identified needs for additional ROWs can be accommodated without the need for a plan amendment. A suite of BMPs are provided (with new ones being developed over time) from which site-specific COAs can be applied, thus avoiding overly broad regulations. Application of seasonal restrictions on oil and gas operations will be routinely waived in DDAs to facilitate year-round development. While seasonal restrictions are applied to operations and maintenance activities outside of DDAs, these do not apply in the case

of emergency needs or if a threat to health and human safety exist. These seasonal limitations may be waived by the Authorized Officer based on identified waiver criteria.

2.10. Detailed Description of Alternatives by Resource

Two components comprise this section. Table 2.6, “Category Restrictions Key” (p. 73) provides a key to the numbered category restrictions used in the alternatives. To streamline language associated with restrictions for mineral and realty actions (e.g., locatable mineral withdrawals, NSO restrictions, areas closed to phosphate, ROW avoidance and exclusion areas), the alternatives use a numbered category system to describe restrictions for a given area. The category restriction for a given area applies to all mineral and realty actions described in the key.

Tables 2.7 through 2.52 identify goals and objectives, management actions common to all alternatives, and management actions by alternative for each resource. Tables 2.7 through 2.52 are arranged according to the following eight resource topics:

Number	Resource Topic
1000	Physical Resources (PR)
2000	Mineral Resources (MR)
3000	Fire and Fuels Management (FM)
4000	Biological Resources (BR)
5000	Heritage and Visual Resources (HR)
6000	Land Resources (LR)
7000	Special Designations (SD)
8000	Socioeconomic Resources (SR)

The numbering system and abbreviations for each of the eight resource topics appear as headings and serve to organize Tables 2.7 through 2.52. Following the headings are the applicable goals and objectives for each resource topic. The goals and objectives in Tables 2.7 through 2.52 apply to all four alternatives under consideration for the entire planning area and would apply for the life of the RMP.

Management actions are anticipated to achieve the goals and objectives identified for each resource topic. Some management actions are constant across all alternatives and are listed for each resource topic under the Management Actions Common to All Alternatives sections. Other management actions vary by alternative and are identified in the Management Actions by Alternative sections.

Actions apply for the life of the RMP, but can be changed by amending the RMP. For example, areas identified as closed to mineral leasing refer to federal mineral estate closed from leasing for the life of the RMP unless changed through an RMP amendment. Furthermore, where seasonal or other restrictions or limitations apply to development, the Authorized Officer may issue written exceptions, waivers, or modifications, including documented supporting analysis, to these limitations (Appendix E (p. 1483)); this applies to all restrictions and limitations.

The maps provided with this document are for illustrative purposes only and may not accurately reflect all decisions due to the size of the resource area; details can be obscured or not readily apparent, or the size may appear larger on the maps so that the feature stands out when depicted on such a broad scale. The management actions that make up the Proposed RMP are in all cases the decision and not modified by the manner in which the decision is displayed on the maps.

Table 2.6. Category Restrictions Key

Restriction Category	Mineral Resources Actions				Realty Actions			
	Oil and gas, Geothermal, and Other Fluid Leasable Minerals	Phosphate	Locatable Minerals	Mineral Materials (Salables)	Wind Energy	Major Utility Systems	Miscellaneous projects, including minor ROWs	Large developments (e.g., power plants)
Category 1	<u>Open</u> with standard lease stipulations	<u>Open</u> with standard stipulations	<u>Open</u> subject to CFR 3809	<u>Open</u> with standard stipulations	<u>Open</u> with standard stipulations	<u>Open</u> with standard stipulations	<u>Open</u> with standard stipulations	<u>Open</u> with standard stipulations
Category 2	<u>Open</u> with seasonal and/or CSU restrictions	<u>Open</u> with seasonal and/or CSU restrictions	<u>Open</u> subject to CFR 3809	<u>Open</u> with seasonal and/or CSU restrictions	<u>Open</u> with seasonal and/or CSU restrictions	<u>Open</u> with seasonal and/or CSU restrictions	<u>Open</u> with seasonal and/or CSU restrictions	<u>Open</u> with seasonal and/or CSU restrictions
Category 3	<u>Open</u> with NSO	<u>Open</u>	<u>Open</u> subject to CFR 3809	<u>Closed</u>	<u>Avoided</u>	<u>Avoided</u>	<u>Avoided</u>	<u>Avoided</u>
Category 4	<u>Open</u> with NSO	<u>Closed</u>	<u>Open</u> subject to CFR 3809	<u>Closed</u>	<u>Excluded</u>	<u>Excluded</u>	<u>Excluded</u>	<u>Excluded</u>
Category 5	<u>Open</u> with NSO	<u>Closed</u>	<u>Pursue withdrawal</u>	<u>Closed</u>	<u>Excluded</u>	<u>Excluded</u>	<u>Excluded</u>	<u>Excluded</u>
Category 6	<u>Closed</u> to leasing	<u>Closed</u>	<u>Pursue withdrawal</u>	<u>Closed</u>	<u>Excluded</u>	<u>Excluded</u>	<u>Excluded</u>	<u>Excluded</u>
CFR Code of Federal Regulations CSU Controlled Surface Use NSO No Surface Occupancy ROW right-of-way								

Table 2.7. Detailed Alternative Descriptions by Resource

MANAGEMENT GOALS COMMON TO ALL RESOURCES AND ALTERNATIVES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>The BLM Lander Field Office will:</p> <p>GOAL Common: 1 Manage the public lands within the requirements of all applicable federal and state laws, policy, and guidance. Manage to support valid and existing rights.</p> <p>GOAL Common: 2 Use cooperative consultation with all applicable state and local governments to aid in effective cross-jurisdictional management of land and resources.</p> <p>GOAL Common: 3 Manage public land resources and resource uses in consideration of all other resource values of the applicable lands.</p> <p>GOAL Common: 4 Manage public land resources within the natural variations and capability of the applicable lands.</p> <p>GOAL Common: 5 Require onsite mitigation and encourage voluntary offsite mitigation to offset the adverse impacts of projects or actions. Do not use offsite mitigation to justify unnecessary or undue onsite degradation.</p> <p>GOAL Common: 6 Manage vegetation, soil, landform, water quantity and quality, and air quality to maintain, meet, make substantial progress towards or exceed the Wyoming Standards for Healthy Rangelands.</p> <p>GOAL Common: 7 Use an integrated management approach (mechanical, chemical, or biological treatments, prescribed fire, or grazing management techniques) to achieve desired vegetative communities, to reduce fuel loading and to control invasive species. Implementing management actions consistent with Partners Against Weeds and state and local weed management plans.</p> <p>GOAL Common: 8 Co-locate ROWs whenever possible.</p> <p>GOAL Common: 9 Conduct appropriate project level NEPA analysis and make consideration for levels of analyzed impacts.</p> <p>GOAL Common: 10 Manage resources to contribute to the economic stability of local communities.</p>					

Table 2.8. 1000 Physical Resources (PR) – Air Quality

1000 PHYSICAL RESOURCES (PR) – AIR QUALITY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal PR: 1 Minimize the impact of management actions in the planning area on air quality by complying with all applicable air quality laws, rules, and regulations.</p> <p>Objectives:</p> <p>PR: 1.1 Maintain concentrations of criteria pollutants in compliance with applicable state and federal Ambient Air Quality Standards within the scope of BLM's authority.</p> <p>PR: 1.2 Maintain concentrations of PSD pollutants associated with management actions in compliance with the applicable increment.</p> <p>Goal PR: 2 Implement management actions in the planning area to improve air quality as practicable.</p> <p>Objectives:</p> <p>PR: 2.1 Reduce visibility-impairing pollutants in accordance with the reasonable progress goals and timeframes established within the State of Wyoming's Regional Haze State Implementation Plan.</p> <p>PR: 2.2 Reduce atmospheric deposition pollutants to levels below generally accepted levels of concern and levels of acceptable change.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
1001	PR: 1.1, 1.2	Work cooperatively with agencies and stakeholders to develop an Air Quality Assessment Protocol to estimate potential future air quality.			
1002	PR: 1.1, 2.1	Define a criteria pollutant and AQRV monitoring strategy and work cooperatively to establish a monitoring network by creating a method for siting air quality monitors in order to provide additional data for describing background concentrations.			
1003	PR: 1.1, 1.2, 2.1, 2.2	Require Best Management Practices to meet air quality goals.			
1004	PR: 2.1	Require dust abatement measures for all BLM-authorized activities. Mandate dust abatement control techniques in identified problem areas.			
1005	PR: 1	In cooperation with the Wyoming DEQ AQD, ensure that the BLM's prescribed fire actions comply with applicable smoke-management regulations.			
1006	PR: 2.1, 1.1	Utilize and enhance a cooperative process to share information on proposed emission sources and air quality issues with the public and federal, state, and county agencies.			
1007	PR: 1, 2	In all project-level EISs and EAs, on a case-by-base basis in accordance with the Lander Air Resources Management Plan (Appendix F (p. 1491)), require quantitative air quality modeling of industrial activities in order to determine the potential impacts of proposed emission sources and subsequent potential mitigation strategies.			

1000 PHYSICAL RESOURCES (PR) – AIR QUALITY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
MANAGEMENT ACTIONS BY ALTERNATIVE					
1008	PR: 1, 1.1, 1.2	Require that all BLM-authorized activities minimize adverse impacts to air quality. Allow air quality impacts up to applicable standards and guidelines.	Same as Alternative A, plus in cooperation with Wyoming DEQ, implement prevention and mitigation measures to reduce emissions in the planning area from current levels and to improve air quality.	Same as Alternative A.	Same as Alternative A.

Table 2.9. 1000 Physical Resources (PR) – Soil

1000 PHYSICAL RESOURCES (PR) – SOIL					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal PR: 3 Prevent impairment of soil productivity from accelerated loss, physical or chemical degradation of the soil resource, or surface disturbance.					
Objectives:					
PR: 3.1 Develop, test, and apply soil interpretations to guide the use and management of soils and related resources.					
PR: 3.2 Collect and maintain soil resource information at a level of detail consistent with management needs and in accordance with the National Cooperative Soil Survey program and the BLM Wyoming Strategic Soil Survey Plan, which details criteria that determine funding priority for areas needing soil survey information.					
PR: 3.3 Manage to minimize degradation of soils. Consider prevention of soil degradation when authorizing activities.					
PR: 3.4 Manage soil to achieve stability and to support the hydrologic cycle by providing for water capture, storage, and sustained release.					
Goal PR: 4 Ensure that management actions are consistent with inherent soil resource capabilities.					
Objective:					
PR: 4.1 Require that management actions and BLM-authorized activities consider soil suitability and limitations for the proposed use in the planning and design stages.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
N/A	N/A	Note: Reclamation goals, objectives, and alternatives are found below under the Soil Reclamation section. Management actions for oil and gas produced water are in the Leasable-Oil and Gas section. See Record 4011 for limits of slope related to timber harvest methods.			
1009	PR: 3.1, 3.2	Pursue and support the completion of Order 3 soil surveys and identify areas with LRP.			
1010	PR: 3.1, 4.1	Develop/adopt a soil interpretation for soil rehabilitation potential. Consider soil suitability for proposed use and soil rehabilitation at the planning and design phase of all BLM-authorized activities.			
1011	PR: 3.3	Prohibit surface-disturbing activities during periods when soil material is saturated or times when watershed damage is likely to occur. Surface-disturbing activities during periods when soil is frozen will be evaluated on a site-specific project level. The proposed activities will be analyzed to determine the impacts to the soil and plant resources and compare these impacts on frozen soil versus non-frozen soil.			
1012	PR: 3.3	Require a very detailed site analysis and reclamation plan before development if soil in LRP areas (Map 11) will be disturbed.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

1000 PHYSICAL RESOURCES (PR) – SOIL					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
1013	PR: 3.2, 3.3, 3.4, 4.1	Authorize soil-disturbing activities in areas with LRP soils (Map 11). Mineral and realty actions in these areas are managed with Category 2 restrictions.	Prohibit soil-disturbing activities in areas with LRP (Map 11). Mineral and realty actions in these areas are managed with Category 6 restrictions.	Same as Alternative A.	Soil-disturbing activities will be open with CSU restrictions in areas with LRP soils. Avoidance of LRP soils will be implemented on site-specific locations whenever possible, but is not a requirement.
1014	PR: 3.3, 3.4, 4.1	Prohibit surface-disturbing activities on slopes greater than 25 percent (Map 10) unless an exception, waiver, or modification is granted by the Authorized Officer.	Prohibit surface-disturbing activities on slopes greater than 15 percent (Map 10) unless an exception, waiver, or modification is granted by the Authorized Officer.	Same as Alternative A.	Same as Alternative A, plus manage slopes between 15 and 24 percent with CSU restrictions.

Table 2.10. 1000 Physical Resources (PR) – Soil Reclamation

1000 PHYSICAL RESOURCES (PR) – SOIL RECLAMATION					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal PR: 5 Require successful reclamation of surface-disturbing activities to restore healthy, functioning plant communities and watershed function.					
Objectives:					
PR: 5.1 Revegetate to stabilize surface soils, establish natural plant composition and self-perpetuating plant communities capable of supporting the post-disturbance land use.					
PR: 5.2 Develop interim, and final reclamation standards appropriate for resource and resource use enhancement on a project-specific basis.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
1015	PR: 5.1, 5.2	Implement BLM National and Wyoming Reclamation Policies requiring reclamation plans be developed for all federal actions authorized, conducted, or funded by the BLM that disturb vegetation and/or the mineral/soil resources. For future actions, require a full reclamation bond specific to the site in accordance with 43 CFR 3104.2, 3104.3, and 3104.5. Ensure bonds are sufficient for costs relative to reclamation (Connelly et al. 2000, Hagen et al. 2007) that would result in full restoration of the lands to their condition before disturbance. Base the reclamation costs on the assumption that contractors for the BLM will perform the work.			
1016	PR: 5.1, 5.2	Require that surface-disturbing activities minimize the surface disturbance footprint to the maximum extent possible to limit the areas requiring reclamation. Limit disturbance of desirable vegetative communities established during interim reclamation when implementing final reclamation.			
1017	PR: 5.1, 5.2	Require that all reclamation plans identify the desired plant community for final reclamation.			
1018	PR: 5.1, 5.2	Consider wildlife habitat objectives in all final reclamation objectives. In Core Area, final reclamation objectives will be to restore greater sage-grouse habitat. Include metrics to ensure that restoration goals are met.			
1019	PR: 3.3, 3.4, 4.1	Require site stabilization and sediment control in compliance with Wyoming Stormwater Discharge requirements and BLM reclamation policies.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

1000 PHYSICAL RESOURCES (PR) – SOIL RECLAMATION					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
1020	PR: 5.1, 5.2	Soil management and reclamation practices will be identified based on site-specific characteristics and implemented according to BLM reclamation policies.	Same as Alternative A, plus require that site-specific interim and final reclamation practices be developed in accordance with reclamation policies that will meet the non-DDA reclamation standards as identified in Appendix D (p. 1477).	Same as Alternative A.	Same as Alternative A, plus require that site-specific interim and final reclamation practices be developed in accordance with national and Wyoming reclamation policies that will meet the reclamation standards as identified in Appendix D (p. 1477). The type and detail of the reclamation plan will be commensurate with the extent and duration of soil disturbance. For extensive disturbance such as a full-field oil and gas development, a detailed, multi-phase plan such as the Continental Divide Creston oil and gas project (CDC) reclamation plan attached as Appendix G (p. 1505) will be required. (Note: The CDC oil and gas reclamation plan is offered as an example of the type of detailed plan that would be required. It is not considered to be a final plan, but only an example.)

1000 PHYSICAL RESOURCES (PR) – SOIL RECLAMATION					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
1021	PR: 5.2	Require that during and following reclamation activities, the land user is responsible for monitoring to help ensure reclamation success as defined in reclamation policies. Require follow-up seeding and/or other corrective or remedial erosion-control measures on areas of surface disturbance, as appropriate. During and following reclamation activities the land user is responsible for monitoring and, if necessary, protecting the reclaimed landscape until reclamation standards have been achieved.	Same as Alternative A, plus monitoring and follow-up reclamation practices will continue on interim and final reclaimed areas until the standards for non-DDA areas as identified in Appendix D (p. 1477) have been successfully achieved.	Same as Alternative A.	Same as Alternative A, plus monitoring and follow-up reclamation practices will continue on interim and final reclaimed areas until the standards identified in Appendix D (p. 1477) have been successfully achieved.
1022	PR: 5	Identify areas with soil disturbance that have not been successfully reclaimed in accordance with reclamation policies, as opportunities occur.	Inventory BLM-administered lands to identify areas with soil disturbance that have not been successfully reclaimed. Prioritize reclamation projects in consideration of impacts to water quality, wildlife habitat, and visual resources. Utilize inventory if offsite mitigation is being considered. Require reclamation in accordance with reclamation policies and the non-DDA reclamation standards as identified in Appendix D (p. 1477).	Same as Alternative A.	Identify areas with soil disturbance that were not successfully reclaimed. Priorities are determined on a case-by-case basis with an emphasis on greater sage-grouse Core Area and other important wildlife habitat. Require reclamation in accordance with reclamation policies and reclamation standards as identified in Appendix D (p. 1477). Develop partnerships and funding sources to implement reclamation where no responsible party has the reclamation obligation.

1000 PHYSICAL RESOURCES (PR) – SOIL RECLAMATION					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
1023	PR: 5	Adapt reclamation methods to specific requirements based on plant communities within potential ecological sites and site-specific objectives.	Focus reclamation practices on restoring surface-disturbing activities to an ecological condition equal to or better than predisturbance composition and production levels based on habitat objectives. Require reclaimed areas to meet non-DDA reclamation standards identified in Appendix D (p. 1477) or restore to habitat objectives, whichever requires a higher level of standards to meet final reclamation success.	Focus reclamation on stabilizing soils and establishing ground cover sufficient to reduce and/or prevent accelerated soil erosion and noxious weed infestation.	Same as Alternative A, plus incorporate reclamation objectives and require reclamation plans, including reclamation standards as identified in Appendix D (p. 1477) on a site-specific basis.
1024	PR: 5	Utilize management practices to achieve reclamation standards as defined in BLM reclamation policies and implement project-specific reclamation practices.	Utilize management practices that achieve reclamation objectives and standards for non-DDA, select management practices based on restoring the site potential, and emphasize plant communities that are habitat compatible (see Appendix D (p. 1477)).	Utilize management practices that achieve site-specific reclamation objectives specific to site stabilization. Select management practices based on the ability to establish ground cover for erosion control purposes.	Utilize management practices including phased development recognized in Appendix H (p. 1521) and required BLM reclamation policies to achieve reclamation success. Require Reclamation Objectives and Standards as identified in Appendix D (p. 1477) in all reclamation plans.
1025	PR: 5	Reclamation management practices will select native plant species based on site characteristics and ecological site descriptions.	Reclamation management practices will select and emphasize native plant species conducive to the site potential and habitat compatibility and require reclaimed areas to meet non-DDA reclamation standards identified in Appendix D (p. 1477).	Reclamation management practices would utilize native and approved nonnative plant species to achieve reclamation objectives.	Same as Alternative A, plus reclamation success will be determined based on the criteria and standards identified in Appendix D (p. 1477).

Table 2.11. 1000 Physical Resources (PR) – Water

1000 PHYSICAL RESOURCES (PR) – WATER					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal PR: 6 Maintain or improve surface water and groundwater quantity and quality consistent with applicable state and federal standards and regulations.</p> <p>Objectives:</p> <p>PR: 6.1 Take appropriate actions to protect all Wyoming surface water designated uses including but not limited to fisheries, aquatic life, drinking water supplies, recreation, and agriculture, and to control all potential causes of impairment.</p> <p>PR: 6.2 Maintain the physical, chemical, and biological integrity of surface waters in accordance with Standards 2 and 5 of the Wyoming Standards for Healthy Rangelands.</p> <p>PR: 6.3 Enhance the physical, chemical, and biological integrity of surface waters that are functioning below PFC.</p> <p>PR: 6.4 Protect Class 1 waters (Outstanding Surface Waters) as determined by the State of Wyoming. (See Wild and Scenic Rivers section in Special Designations for additional actions).</p> <p>PR: 6.5 Restore, maintain, and enhance watershed, wetland, and riparian functions.</p> <p>PR: 6.6 Protect and improve groundwater quality and quantity through appropriate measures (e.g., predictive modeling, monitoring, and protection of known water recharge areas) during BLM activities and permitted actions over the life of the plan.</p> <p>PR: 6.7 Coordinate with appropriate entities to rehabilitate or reclaim functionally compromised reservoirs on BLM-administered lands.</p> <p>PR: 6.8 Minimize degradation of surface water and groundwater resources. Require the treatment of surface water and groundwater that has been impacted by spills or other releases of chemicals, petroleum products, and produced water on BLM-administered lands. Require compliance with Wyoming DEQ requirements for reporting and treating of spills and releases of chemicals, petroleum products, and produced water.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
1026	PR: 6.6, 6.7, 6.8	Identify potential surface and groundwater quality impairments through inventories and routine monitoring activities and report potential impairments to Wyoming DEQ.			
1027	PR: 6.1, 6.2, 6.6	Require the use of Best Management Practices and mitigation applied as COAs to reduce point and nonpoint source pollution and to limit groundwater contamination.			
1028	PR: 6.1, 6.6, 6.7	Control nonpoint source pollution by improving riparian-wetland health and by controlling dust, accelerated erosion, and other surface disturbances.			
1029	PR: 6.1, 6.3, 6.5, 6.6, 6.7, 6.8	Participate in the development, implementation, and monitoring of watershed management plans and/or TMDLs with interested stakeholders including the Wyoming DEQ to improve water quality.			

1000 PHYSICAL RESOURCES (PR) – WATER					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
1030	PR: 6.1, 6.3, 6.5, 6.6, 6.7, 6.8	Incorporate requirements and methodology for achieving watershed improvement into activity plans, as the BLM deems appropriate, on BLM-administered lands.			
1031	PR: 6.1, 6.4	Control sources of pollution to Class 1 waters. Collaborate with the Wyoming DEQ to prevent water quality degradation of Class 1 waters (Map 6).			
1032	PR: 6.3	Prioritize management to improve water quality of waters listed on the current CWA 303(d) list or which do not meet Standards 2 or 5 of the Wyoming Standards for Healthy Rangelands.			
1033	PR: 6.1, 6.2, 6.6	Enter into agreements with state and local governments as they develop source water and wellhead protection plans that detail specific provisions to protect drinking water sources and the quality of surface and groundwater. Consider impacts to domestic water supplies in treating invasive species.			
1034	PR: 6.2, 6.5	Avoid the authorization of activities likely to cause accelerated channel erosion and adverse adjustments in channel geometry (dimension, pattern, or profile).			
1035	PR: 6.3, 6.7, 6.8	Take actions to improve the biological, chemical, and geomorphic conditions of streams and riparian-wetland areas adversely impacted by BLM-authorized activities or by activities upstream of BLM-administered lands.			
1036	PR: 6.1, 6.2, 6.3, 6.4, 6.6, 6.8	Integrate soil, groundwater, and surface water management to maintain or improve groundwater and surface water quality. Evaluate the need to require groundwater monitoring as part of site-specific NEPA analysis.			
1037	PR: 6.1, 6.4	Manage BLM-administered lands to support in-stream flow designations.			
1038	PR: 6.6	Develop and implement integrated pest management to control and eradicate invasive species in consideration of impacts to domestic water supplies.			
1039	PR: 6.1	Develop and implement watershed management plans as necessary and cooperate with existing and ongoing watershed management initiatives started by other stakeholders.			
1040	PR: 6.1	Partner with the Wyoming DEQ in protecting groundwater quality and quantity through monitoring plans and implementing these with the support of project proponents.			
1041	PR: 6.6	Inventory reservoirs and assess condition and suitability of design to limit mosquito breeding. Identify functionally compromised reservoirs and partner with interested entities to rehabilitate or reclaim compromised reservoirs. Prioritize reservoirs in consideration of potential for failure, impacts to water quality, and importance for wild horses, wildlife, and livestock grazing. Utilize prioritization when identifying opportunities for offsite mitigations.			
1042	PR: 6.1	Enforce measures to limit degradation of water quality such as avoiding disturbance of soils with high erosion potential, implementing zero runoff programs on large-scale surface-disturbing activities, requiring bonding for site reclamation, and reclaiming abandoned surface disturbances.			
1043	PR: 6.2, 6.5, 6.6, 6.8	For all projects, require the testing of precipitated solids where the BLM has documented the possibility of contamination. Require the removal of contaminated solids when identified.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

1000 PHYSICAL RESOURCES (PR) – WATER					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
1044	PR: 6.1, 6.2, 6.3	On a case-by-case basis, prohibit or avoid surface-disturbing activities in groundwater recharge areas to prevent contamination. Mineral and realty actions in these areas are managed with Category 1 restrictions.	Prioritize the identification of Sole Source Aquifers, Wyoming DEQ Water Zones 1-3 and groundwater recharge areas. Avoid surface-disturbing activities with potential to contaminate groundwater in identified or inferred groundwater recharge areas. Mineral and realty actions in areas underlain by an identified Sole Source Aquifer are managed with Category 3 restrictions.	Allow surface-disturbing activities in known or inferred groundwater recharge areas, but implement Best Management Practices to prevent contamination.	Same as Alternative B, except that Wyoming DEQ Water Zones 1-3 are managed with controlled surface use.
1045	PR: 6.6	Restrictions on pesticide use in aquifer recharge areas are limited to label instructions.	Prohibit pesticide use in known or inferred aquifer recharge areas (as formally designated) and any areas underlain by a Sole Source Aquifer or Wellhead Protection Area.	Same as Alternative A.	Same as Alternative B.
1046	PR: 6.1, 6.2, 6.3, 6.8	In cooperation with stakeholders, implement management actions to prevent degradation of ground and surface water quality on a case-by-case basis, utilizing existing watershed plans where possible.	Implement management actions on a watershed basis to prevent degradation of ground and surface water and to improve water quality, utilizing existing watershed plans where possible.	Same as Alternative A.	Same as Alternative A, plus require project-level NEPA analyses for oil and gas development with project-specific comprehensive groundwater monitoring plans and programs to track potential groundwater impacts as drilling and productions occur. The level of monitoring will depend on the size of the proposed project, the groundwater vulnerability, the target zone of operations, and other site-specific factors.
1047	PR: 6.1, 6.2, 6.5, 6.8	Permanent facilities in floodplains and riparian-wetland areas (Map 5) are managed with Category 4 restrictions, except to benefit watershed health or vegetation.	Permanent facilities, including road crossings, in floodplains and riparian-wetland areas are managed with Category 6 restrictions (Map 5).	Allow new permanent facilities in floodplains and riparian-wetland areas, provided there are no practicable alternatives and sufficient mitigation is	Do not authorize permanent facilities including roads in 100-year floodplains (where mapped) and riparian-wetland areas (Map 5) except to benefit

1000 PHYSICAL RESOURCES (PR) – WATER					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		Linear watercourse crossings are considered on a case-by-case basis.	All linear underground facilities crossing watercourses are bored to avoid riparian-wetland area disturbance.	undertaken so that the action will meet the requirements of Executive Orders 11988 and 11990, wetland protections afforded under the CWA, and federal and state water quality actions. Linear watercourse crossings are considered on a case-by-case basis.	watershed health or vegetation. Linear watercourse crossings are considered on a case-by-case basis and authorized only with mitigation such as crossing at right angles or temporary bridges.

Table 2.12. 1000 Physical Resources (PR) – Cave and Karst Resources

1000 PHYSICAL RESOURCES (PR) – CAVE AND KARST RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal PR: 7 Conserve significant cave and karst resources.					
Objective:					
PR: 7.1 Identify and inventory caves and karst resources and determine if they meet the significance criteria of 43 CFR 37.11(c).					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
1048	PR: 7.1	As cave or karst resources are identified, develop site-specific management prescriptions to protect significant cave and karst resources, such as managing the resource as an SRMA.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
N/A	N/A	There are no management actions by alternative identified for cave and karst resources.			

Table 2.13. 1000 Physical Resources (PR) – Lands with Wilderness Characteristics

1000 PHYSICAL RESOURCES (PR) – LANDS WITH WILDERNESS CHARACTERISTICS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal PR: 8 Maintain existing wilderness characteristics associated within identified areas (outside of WSAs) found to contain wilderness characteristics.					
Objective:					
PR: 8.1 Maintain wilderness characteristics in areas managed as non-WSA lands with wilderness characteristics.					
MANAGEMENT ACTIONS BY ALTERNATIVE					
1049	PR: 8.1	Lands with wilderness characteristics are not specially managed to protect wilderness values. Portions of the area identified as the Little Red Creek Complex are contained within the Whiskey Mountain ACEC and managed in accordance with the ACEC prescriptions (Map 12).	The following areas will be managed as non-WSA lands with wilderness characteristics to protect wilderness values: <ul style="list-style-type: none"> Little Red Creek Complex including Red Creek and Torrey Rim, (5,490 acres) (Map 13). 	Do not separately manage areas as non-WSA lands with wilderness characteristics to protect wilderness values.	The following areas will be managed as non-WSA lands with wilderness characteristics to protect wilderness values: <ul style="list-style-type: none"> Little Red Creek Complex including Red Creek and portions of Torrey Rim (4,954 acres) (Map 14).
1050	PR: 8.1	Travel management actions for the Whiskey Mountain ACEC portion of the Little Red Creek Complex are in the Special Designations section. Limit motorized travel in the non-ACEC portion of the Little Red Creek Complex to existing roads and trails.	Close the Little Red Creek Complex to motorized and mechanized travel.	Same as Alternative A.	Close the Little Red Creek Complex to motorized travel and limit mechanized travel to designated routes. Closures will be located at strategic locations on BLM-administered lands, motorized travel will be allowed on some roads up to the identified closure points.
1051	PR: 8.1	No similar action.	Manage recreational use in the Little Red Creek Complex to maintain wilderness characteristics.	Same as Alternative A.	Same as Alternative B.
1052	PR: 8.1	No similar action.	Work with partners, cooperators, tribal groups, and willing landowners to pursue foot and horseback access to the Little Red Creek Complex and the adjacent Fitzpatrick Wilderness Area (Map 13).	Same as Alternative A.	Same as Alternative B.

Table 2.14. 2000 Mineral Resources (MR)

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal MR: 1 Develop available federal mineral estate.</p> <p>Objectives:</p> <p>MR: 1.1 Provide opportunities to explore for, permit, and sell mineral materials.</p> <p>MR: 1.2 Provide opportunities for mining claimants to explore for and develop locatable minerals.</p> <p>MR: 1.3 Provide opportunities for the exploration and development of solid and fluid leasable minerals.</p> <p>Goal MR: 2 Support the use of mineral resources to meet domestic demand.</p> <p>Goal MR: 3 Provide protections for resource values in areas of conflict with mineral exploration and development.</p> <p>Objectives:</p> <p>MR: 3.1 Manage oil and gas operations in the Beaver Rim MLP area (150,782 acres) to prevent degradation of visual and geological resources, sensitive soils, Native American or culturally significant sites, unique vegetation communities, wild horse migration routes, and headwaters of Platte River (Map 132).</p> <p>MR: 3.2 Prevent degradation of headwaters of the Sweetwater River occurring in the Beaver Rim MLP area.</p> <p>MR: 3.3 Protect the visual setting of Native American sites in the Beaver Rim MLP area.</p> <p>MR: 3.4 Protect paleontological resources in the Beaver Rim MLP area.</p> <p>MR: 3.5 Protect the free range and genetic diversity of wild horses in the Beaver Rim MLP area. Improve opportunities for public viewing of wild horses.</p> <p>MR: 3.6 Protect unique plant communities in the Beaver Rim MLP area.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
2001	MR: 1.3	Require a Land Use Plan amendment before leasing coal or oil shale-tar sands.			
2002	MR: 1.3	Incorporate proponent committed or BLM Required Design Features or mitigation such as BMPs as COAs for any authorized mineral activity for federal minerals, regardless of surface ownership. In project-level EISs and EAs, require, on a case-by-case basis, the development of a wildlife resource monitoring and mitigation plan to address potential impacts from mineral development on wildlife populations and/or habitat.			

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2003	MR: 1.3	Areas within the NLCS are closed to geothermal energy development. Additional management for NLCS lands provided below under Special Designations. These areas include: <ul style="list-style-type: none">• WSAs (55,338 acres) (Map 128)• CDNST (Map 121)• NHTs (Map 123)• NWSRS-eligible waterway segments (9,919 acres) (Map 129)			
2004	MR: 1.3	All oil and gas and other mineral leases are subject to standard lease stipulations; additional stipulations may apply in some areas. Require unitization when deemed necessary for proper development and operation of an area or to facilitate more orderly (e.g., phased and/or clustered) development as a means of minimizing adverse impacts to resources, including greater sage-grouse, so long as the unitization plan adequately protects the rights of all parties, including the United States. In areas that are closed to mineral leasing (Category 6 restrictions), do not re-offer existing leases when they expire. If drainage occurs in an area closed to oil and gas leasing, authorize leasing on a case-by-case basis with Category 4 restrictions. Identified areas with <i>Yermo xanthocephalus</i> (“Yermo”) are NSO for oil and gas leasing. The locatable mineral withdrawal for Yermo critical habitat will be extended. When conducting site-specific NEPA analysis of a proposed action in Core Area, closely examine the applicability of categorical exclusions. If extraordinary circumstances review is applicable, determine whether those circumstances exist.			
2005	MR: 1.3	Encourage geophysical operators to share scientific information in order to minimize surface impacts.			
2006	MR: 1.3	Identify areas disturbed by expired mineral material sales including free-use permits and community use pits. Prioritize reclamation of these sites, starting with those in Core Area where restoration as long-term greater sage-grouse habitat is possible. Next in priority are those in riparian-wetland areas, ACECs, the NTMC, VRM Class II areas, general greater sage-grouse habitat, and wildlife migration corridors. Seek partnerships with others, including applicants seeking suitable offsite mitigation opportunities.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
LOCATABLE MINERALS					
2007	MR: 1.2	Approximately 23,114 acres are maintained for withdrawal from locatable mineral entry and extensions are applied for as needed (Map 21). (Approximately 8,634 acres are withdrawn in pre-FLPMA actions which would continue indefinitely.) See corresponding alternatives for specific details and acreage of withdrawals. A total of 2,777,334 acres are open to locatable mineral entry (Map 21).	Approximately 1,632,605 acres are pursued for withdrawal from locatable mineral entry (Map 22). (Approximately 8,634 acres are withdrawn in pre-FLPMA actions which would continue indefinitely.) See corresponding alternatives for specific details and acreage of withdrawals. A total of 1,167,862 acres are open to locatable mineral entry (Map 22).	Approximately 0 acres are pursued for withdrawal from locatable mineral entry (Map 23). (Approximately 8,634 acres are withdrawn in pre-FLPMA actions which would continue indefinitely.) See corresponding alternatives for specific details and acreage of withdrawals. A total of 2,800,467 acres are open to locatable mineral entry (Map 23).	Approximately 449,068 acres are pursued for withdrawal from locatable mineral entry (Map 24). (Approximately 8,634 acres are withdrawn in pre-FLPMA actions which would continue indefinitely.) Any existing [mining] claims within the withdrawal area subject to validity exams. See corresponding alternatives for specific details of acreage of withdrawals.

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		Note: Withdrawals are a realty action and are identified here just for information purposes.			A total of 2,351,399 acres are open to locatable mineral entry (Map 24).
LEASABLE MINERALS – GEOTHERMAL					
2008	MR: 1.3	<p>728,277 acres of federal mineral estate are open to geothermal leasing subject to a case-by-case analysis of impacts to ACECs and other resource conflicts.</p> <p>1,703,913 acres of federal mineral estate are open to geothermal leasing with moderate constraints (Map 25).</p> <p>242,226 acres of federal mineral estate are open to geothermal leasing with major constraints (Map 25).</p> <p>134,686 acres of federal mineral estate are closed to geothermal leasing (Map 25).</p>	<p>322,717 acres of federal mineral estate are open to geothermal leasing with moderate constraints (Map 26).</p> <p>175,369 acres of federal mineral estate are open to geothermal leasing with major constraints (Map 26).</p> <p>2,304,728 acres of federal mineral estate are closed to geothermal leasing (Map 26).</p> <p>Constraints applied for oil and gas leasing also apply to geothermal leasing.</p>	<p>797,174 acres of federal mineral estate are open to geothermal leasing subject to a case-by-case analysis of impacts to ACECs and other resource conflicts.</p> <p>1,738,283 acres of federal mineral estate are open to geothermal leasing with moderate constraints (Map 27).</p> <p>165,747 acres of federal mineral estate are open to geothermal leasing with major constraints (Map 27).</p> <p>107,897 acres of federal mineral estate are closed to geothermal leasing (Map 27).</p>	<p>1,198,821 acres of federal mineral estate are open to geothermal leasing with moderate constraints (Map 28).</p> <p>859,566 acres of federal mineral estate are open to geothermal leasing with major constraints (Map 28).</p> <p>696,816 acres of federal mineral estate are closed to geothermal leasing (Map 28).</p> <p>Constraints applied for oil and gas leasing also apply to geothermal leasing.</p>
LEASABLE MINERALS – OIL AND GAS					
2009	MR: 1.3	Approximately 731,144 acres of federal mineral estate are open to oil and gas leasing subject only to <i>standard</i> lease stipulations (Map 29).	Approximately 32,952 acres of federal mineral estate are open to oil and gas leasing subject only to <i>standard</i> lease stipulations (Map 30).	Approximately 804,794 acres of federal mineral estate are open to oil and gas leasing subject only to <i>standard</i> lease stipulations (Map 31).	Approximately 44,945 acres of federal mineral estate are open to oil and gas leasing subject only to <i>standard</i> lease stipulations (Map 32).
2010	MR: 1.3	Approximately 1,715,341 acres of federal mineral estate are open to oil and gas leasing subject to <i>moderate</i> constraints (Map 29).	Approximately 309,100 acres of federal mineral estate are open to oil and gas leasing subject to <i>moderate</i> constraints (Map 30).	Approximately 1,755,628 acres of federal mineral estate are open to oil and gas leasing subject to <i>moderate</i> constraints (Map 31).	Approximately 1,260,715 acres of federal mineral estate are open to oil and gas leasing subject to <i>moderate</i> constraints (Map 32).

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2011	MR: 1.3	Approximately 337,481 acres of federal mineral estate are open to oil and gas leasing subject to <i>major</i> constraints (Map 29).	Approximately 187,524 acres of federal mineral estate are open to oil and gas leasing subject to <i>major</i> constraints (Map 30).	Approximately 248,601 acres of federal mineral estate are open to oil and gas leasing subject to <i>major</i> constraints (Map 31).	Approximately 1,336,867 acres of federal mineral estate are open to oil and gas leasing subject to <i>major</i> constraints (Map 32).
2012	MR: 1.3	Approximately 25,136 acres of federal mineral estate are closed to oil and gas leasing (Map 29).	Approximately 2,279,525 acres of federal mineral estate are closed to oil and gas leasing (Map 30).	Approximately 78 acres of federal mineral estate are closed to oil and gas leasing (Map 31).	Approximately 166,574 acres of federal mineral estate are closed to oil and gas leasing (Map 32).
2013	PR: 3.3	Consider soil erosion, degradation of soil quality, sedimentation, and other factors in determining the management of produced water on a case-by-case basis in accordance with Onshore Oil and Gas Order No. 7.	Same as Alternative A, except avoid surface discharge of produced water in all new oil and gas development projects.	Same as Alternative A.	Disposal of produced water is authorized in accordance with Onshore Oil and Gas Order #7, Produced Water Handling and in compliance with state regulations. If there is WYPDES permitted discharge, consider soil erosion, degradation of soil quality, sedimentation, and other factors in coordination with the State of Wyoming.
GEOPHYSICAL EXPLORATION					
2014	MR: 1.3	Allow geophysical exploration subject to identified Conditions of Approval. If a particular geophysical exploration can be conducted within the constraints necessary to protect other resources, it will be allowed.	The planning area is open to geophysical exploration except for lands identified as closed to oil and gas exploration and development or subject to major constraints. Geophysical exploration is subject to motorized travel limitations and restrictions on surface-disturbing and disruptive activities. See sections below.	Same as Alternative A.	The planning area is open to geophysical exploration except for lands identified as closed to mineral leasing or NSO to oil and gas leasing. Geophysical exploration is subject to motorized travel limitations and restrictions on surface-disturbing and disruptive activities.
LEASABLE MINERALS – OTHER LEASABLES (PHOSPHATE)					

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2015	MR: 1.3	2,590,482 acres of federal mineral estate are open to phosphate leasing subject to standard lease stipulations (Map 38). 218,619 acres of federal mineral estate are closed to phosphate leasing (Map 38).	551,440 acres of federal mineral estate are open to phosphate leasing subject to standard lease stipulations (Map 39). 2,257,661 acres of federal mineral estate are closed to phosphate leasing (Map 39).	2,642,047 acres of federal mineral estate are open to phosphate leasing subject to standard lease stipulations (Map 40). 167,054 acres of federal mineral estate are closed to phosphate leasing (Map 40).	1,539,655 acres of federal mineral estate are open to phosphate leasing subject to standard lease stipulations (Map 41). 1,269,446 acres of federal mineral estate are closed to phosphate leasing (Map 41).
SALABLE MINERALS					
2016	MR: 1.1	2,493,980 acres with Category 1 or 2 restrictions are open for mineral material disposal on a demand basis (Map 34). 315,121 acres with Category 3-6 restrictions are closed to mineral material disposal (Map 34).	209,842 acres with Category 1 or 2 restrictions are open to mineral material disposal. 2,599,259 acres with Category 3-6 restrictions are closed to mineral material disposal (Map 35). Restrictions for oil and gas, other mineral withdrawals, and VRM restrict the disposal of mineral materials; see those sections.	2,620,997 acres with Category 1 or 2 restrictions are open to mineral material disposal. 188,104 acres with Category 3-6 restrictions are closed to mineral material disposal (Map 36). Areas withdrawn from locatable mineral entry are not available for disposal of mineral materials.	Approximately 1,853,090 acres with Category 1 or 2 restrictions are open for mineral material disposal on a demand basis (Map 37). 956,011 acres with Category 3-6 restrictions are closed to mineral material disposal (Map 37).
DESIGNATED DEVELOPMENT AREAS (DDAs)					
N/A	N/A	Note: Additional management actions regarding DDAs include Records 4033, 4056, and 7137.			
2017	MR: 1.1, 1.2, 1.3	Do not establish DDAs.	Same as Alternative A.	Same as Alternative A.	Establish DDAs for intensive mineral exploration, development, and production (364,630 acres) (Map 134).

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2018	MR: 1.3	Exceptions to stipulations are considered on a site-specific basis following standard practices.	Same as Alternative A.	Same as Alternative A.	New fluid and solid mineral leases and mineral material disposals in DDAs will include standard stipulations. Stipulations will be reviewed at the permit stage and not applied unless required to follow federal laws and policies, or the BLM identifies a site-specific real-time need for the stipulation. Review of requests for exception in DDAs will be expedited. Wildlife seasonal protections for maintenance and operation actions determined to be detrimental to wildlife will not be applied inside DDAs. Refer to Appendix I (p. 1535).
2019	MR: 1.1, 1.2, 1.3	Exceptions to timing limitations for threatened and endangered and species and migratory bird species are granted only in consultation with the USFWS, and if migratory bird take permits or other required permits are obtained.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A including in DDAs.
2020	MR: 1.1	Standard reclamation will be required in all areas.	Same as Alternative A.	Same as Alternative A.	Reclamation will be required in accordance with DDA interim and final reclamation objectives in Appendix D (p. 1477).

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2021	MR: 1.1, 1.2, 1.3	No lands are managed as DDAs.	Same as Alternative A.	Same as Alternative A.	Federal lands and mineral estate not inside a DDA may be designated and managed as DDAs if project-specific environmental analysis determines that adverse impacts to other resources can be successfully mitigated with design features, operating methods, and other mitigation and if a geology and/or reservoir analysis determines that extraction efficiently and adequately produces the mineral resource. Designation of new areas as DDAs or expansion of existing DDA requires an RMP amendment.
MASTER LEASING PLANS (MLPs) – BEAVER RIM					
2022	MR: 3	Do not identify any areas for MLPs.	Do not apply any MLPs. Do not consider MLPs in areas that are closed to oil and gas leasing.	Same as Alternative A.	Apply an MLP to 150,782 acres in the Beaver Rim area (Map 135).
2023	MR: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6	The Beaver Rim area is managed subject to standard stipulations.	The Beaver Rim area is closed to oil and gas leasing because it is located in greater sage-grouse nesting habitat.	Same as Alternative A.	Apply the following provisions of the Beaver Rim MLP to 150,782 acres (Map 135). <ul style="list-style-type: none"> • 29,527 acres in the Beaver MLP area are open to oil and gas leasing subject to an NSO stipulation. • The remainder of the MLP area (121,255 acres) is open to oil and gas leasing subject to CSU stipulations. If any of these acres are determined to be within a mapped floodplain before

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					the lease is issued, an NSO stipulation, rather than a CSU stipulation will be applied.
2024	MR: 3.1, 3.3	Visual simulations may be required in VRM Class II areas of Beaver Rim. There is no special management of visual resources for the area.	Same as Alternative A, plus VRM reflects limits on mineral and realty actions.	Same as Alternative A.	In VRM Class II areas of the Beaver Rim MLP area: <ul style="list-style-type: none"> • Visual simulations in accordance with VRM directive will be required. • Manage the landscape associated with Beaver Rim so that visitors continue to enjoy the unique geologic features.
2025	MR: 3.1, 3.3	There is no special management of visual resources for VRM Class III areas.	Same as Alternative A.	Same as Alternative A.	In VRM Class III areas of the Beaver Rim MLP area: <ul style="list-style-type: none"> • Roads should be sited to follow the contours of the landscape and co-located unless that is not feasible. • Site wells to where they will be less visible and where cuts and fills can be minimized. • Consolidate and use low-profile equipment. • Paint equipment to blend with the background. • Bury pipelines. • Place all linear disturbance such as powerlines in common corridors. • Additional management may be required on a site-specific basis to lessen adverse impacts to visual resources and sensitive soils.

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2026	MR: 3.1, 3.2, 3.6	Final reclamation of oil and gas surface disturbance will restore the original landform and re-establish the native plant community.	The Beaver Rim area is closed to oil and gas leasing.	Same as Alternative A.	Same as Alternative A, plus reclamation will improve riparian-wetland conditions in the Beaver Rim MLP area.
2027	MR: 3.1, 3.2, 3.3, 3.5, 3.6	Parcels are made available for oil and gas leasing in response to nominations. Standard greater sage-grouse management is applied with no minimum spacing of disturbances required.	The Beaver Rim area is closed to oil and gas leasing. Greater sage-grouse Core Area management is applied to the area. No minimum distance between existing disturbance is applied.	Same as Alternative A.	Make parcels in the Beaver Rim area available for lease starting in the CSU areas outside of crucial winter range. Allow no more than 5 percent surface disturbance in the township in which the parcel is located until interim reclamation goals are achieved. Require co-location of new disturbance if technically feasible. If new disturbances cannot be co-located, they must be at least 1.2 miles from existing disturbance.
2028	MR: 3.1, 3.2	Apply a 500-foot riparian-wetland setback.	Apply a 1,320-foot riparian-wetland setback.	Same as Alternative A.	Apply a riparian-wetland setback greater than 500 feet where NEPA analysis determines that a larger area is needed to protect riparian-wetland resources.
2029	MR: 3.2	Do not require watershed monitoring in the Beaver Rim area.	Same as Alternative A.	Same as Alternative A.	Require watershed monitoring including wetlands to verify the effectiveness of watershed protections. Monitoring protocols will establish key variables, such as depth of standing water, duration of saturation, temperature, sediment loading, and other metrics, as determined on a site-specific basis. Strengthen protections, including BMPs, when monitoring indicates ongoing degradation or

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					inadequate benefits from mitigation, including additional site protections and wetland restorations.
2030	MR: 3.1, 3.3	Tribal consultation is initiated on a case-by-case basis.	Same as Alternative A.	Same as Alternative A.	Pending the results of tribal consultation, do not authorize surface disturbance within ¼ mile of sites known to be of interest to Native American tribes (e.g., stone circles, cairns, rock art) as mapped in the Lander Field Office GIS database. Following tribal consultation, apply site-specific management that will protect Native American spiritual and/or cultural values.
2031	MR: 3.4	Conduct inventories for paleontological resources in areas with “very high” and “high” PFYC prior to all surface-disturbing activities.	No similar action.	Same as Alternative A.	Develop an inventory of fossil localities in areas identified as high or very high PFYC to be used in managing mineral activities to protect paleontological resources (see the <i>Paleontological Resources</i> section).
2032	MR: 3.4	No similar action.	No similar action.	No similar action.	Prior to leasing any parcels in the Beaver Rim area, the special management prescriptions identified under the <i>Paleontologic Resources</i> section will be completed.

2000 MINERAL RESOURCES (MR)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
2033	MR: 3.5	Authorize fences on a case-by-case basis.	Fences are not authorized in wild horse HMAs.	Same as Alternative A.	Do not authorize fences in portions of the Beaver Rim MLP area that are used by wild horses to move among HMAs in order to support genetic diversity, unless necessary to improve riparian-wetland conditions. Avoid wild horse HMAs for roads and other linear disturbances.
2034	MR: 3.6	Consider surface disturbance impacts from oil and gas development to unique plant communities.	The Beaver Rim area is closed to oil and gas leasing.	Same as Alternative A.	Avoid surface disturbance in unique plant communities.

Table 2.15. 3000 Fire and Fuels Management (FM)

3000 FIRE AND FUELS MANAGEMENT (FM)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal FM: 1 Protect human life, property, communities at risk from fire and other communities, and enhance and protect the public land resources through vegetation management and the response to wildland fire.					
Objectives:					
FM: 1.1 The BLM will first provide for firefighter and public safety in every fire management activity.					
FM: 1.2 Maintain partnerships with interagency cooperators to strengthen coordination of all fire suppression and fuels management activities.					
FM: 1.3 Promote community assistance and enhance the fire prevention and public education program regarding wildland fire management and vegetation management activities.					
FM: 1.4 Conduct appropriate emergency stabilization and rehabilitation where necessary after wildfire to address current and anticipated needs to resource values at risk.					
Goal FM: 2 Manage fire and fuels to restore or maintain natural ecosystem functions, restore fire-adapted ecosystems, reduce losses from landscape-level wildland fire, and protect multiple-use values.					
Objectives:					
FM: 2.1 Consistent with the 10-year Comprehensive Strategy, prioritize and implement hazardous fuels reduction treatments where the adverse impacts of wildland fire are greatest.					
FM: 2.2 Consult and cooperate with private landowners, affected partners, and local, state, tribal and other federal agencies on individual treatments (such as prescribed fire and biological, mechanical, and chemical treatments) designed to reduce or modify hazardous fuels accumulations.					
FM: 2.3 Working with private landowners, affected partners, and local, state, tribal and other federal agencies, identify areas for potential use of wildland fire to protect, maintain and enhance resources through collaborative development of operational plans.					
FM: 2.4 Restore natural fire regimes and frequency to the landscape.					
FM: 2.5 Using the best available science and on the ground inventory, determine existing condition class of vegetation communities and manage landscapes to improve condition class and ecological conditions described in NRCS Ecological Site Descriptions.					
FM: 2.6 Utilize fuels and vegetation treatments to maintain and enhance greater sage-grouse habitat where applicable.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					

3000 FIRE AND FUELS MANAGEMENT (FM)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
3001	FM: 1.1, 1.2, 1.3, 1.4	Utilize a full suite of wildland fire suppression tactics based on a full evaluation of the highest priority of firefighter and public safety and other factors, such as the circumstances under which a fire occurs, the threat to human infrastructure, important natural and cultural resources, and other values to be protected. Coordinate responses to wildland fire across jurisdictional boundaries. Conduct emergency stabilization and rehabilitation as needed. In greater sage-grouse Core Area, prioritize suppression to conserve the habitat immediately after firefighter and public safety. Where applicable and technically feasible, apply greater sage-grouse BMPs such as those identified in Appendix H (p. 1521).			
3002	FM: 2.5	Partner with the University of Wyoming and other research entities to develop a greater understanding of the ecology and disturbance regime of sagebrush steppe, woodland, and forested vegetation communities found within the planning area. Use this information to develop a regionally specific scientific foundation to vegetation management activities.			
3003	FM: 1.2, 2.3, 2.4, 2.5	Inventory the FRCC (Map 42) of the vegetative communities found within the fire management units (Map 43). In coordination with stakeholders and in consideration of greater sage-grouse Core Area objectives, prioritize areas requiring treatment and utilize appropriate vegetation treatment techniques to improve the condition class across a landscape. Prioritize those projects in areas with the greatest benefits to wildlife and the highest likelihood of wildfire.			
3004	FM: 1.1, 2.1, 2.2, 2.5	Use chemical, biological, and mechanical treatments to reduce the risk of landscape-level wildfire within priority areas, alter fuel loading and improve ecological condition of vegetation communities. Consider the presence and potential for noxious and nonnative plant species when designing wildland fire response and fuels treatments.			
3005	FM: 2, 1.3, 2.2, 2.4, 2.5	Use personal use and commercial vegetation sale permits, where not otherwise constrained or prohibited, for removal of firewood, post and pole, Christmas trees, sawlogs, and wildlings, for hazardous fuels management.			
3006	FM: 2.6	Allow vegetation treatments in greater sage-grouse Core Area that conserve, enhance, or restore greater sage-grouse habitat (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve greater sage-grouse habitat). In identified greater sage-grouse winter range, vegetation treatments should emphasize strategically reducing wildfire risk around or in the winter range and maintaining winter range habitat quality. Prioritize restoration treatments in areas that are thought to limit greater sage-grouse distribution and/or abundance. Focus vegetation treatments outward from existing, intact greater sage-grouse habitat. Utilize BMPs, such as those in Appendix H (p. 1521) and other current habitat management guidelines, when designing and implementing the project.			
3007	FM: 1.1, 1.4	Do not reduce sagebrush canopy cover to less than 15 percent within a defined treatment polygon in suitable greater sage-grouse Core Area habitat unless a vegetation management objective requires additional reduction in sagebrush cover to protect or to conserve habitat quality for greater sage-grouse or other sagebrush steppe dependent and obligate species. Maintain sagebrush and understory diversity (relative to ecological site description) unless such removal is necessary to achieve greater sage-grouse habitat management objectives. Remove conifers or reduce the density of conifers that have encroached into sagebrush plant communities.			
3008	FM: 2.3, 2.4	Outside of greater sage-grouse Core Area, emphasize the reintroduction of fire into its natural role in the ecosystem. Where possible, use wildland fire and prescribed fire to achieve management objectives including reducing hazardous fuel loading, restoring vegetation communities, improving and/or protecting wildlife habitat, enhancing forage production, and addressing forest and woodland health issues such as pine beetle outbreaks.			
3009	FM: 2.2, 2.3	Cooperate with stakeholders to conduct landscape level treatments resulting in enhanced fuels management and/or restoration of fire-adapted ecosystems. In cooperation with stakeholders, manage to promote the growth and persistence of native shrubs, grasses, and forbs.			

3000 FIRE AND FUELS MANAGEMENT (FM)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
3010	FM: 2	Monitor fuels treatment and wildfire burn areas for sufficient time after treatment or fire event in order to determine short-term and long-term project success, detect weed infestations and accelerated soil erosion, and assess overall vegetation recovery. Utilize all available rehabilitation tools to control weed infestation and accelerated soil erosion. Implement rest of treated areas from livestock grazing for two full growing seasons on all prescribed or wildland fire burn areas unless vegetation recovery dictates otherwise.			
3011	FM: 2	Limit the use of fire to treat sagebrush in areas receiving less than 12 inches of annual precipitation. Prescribed fire to reduce hazardous fuels or enhance land health in areas receiving less than 12 inches of annual precipitation could be considered after exploring other potential treatment methods and where cheatgrass is a very minor component of the understory.			
3012	FM: 2	Utilizing Required Design Features and BMPs applied as COAs such as those identified in Appendix H (p. 1521), establish fuels treatment projects at strategic locations to minimize the size of wildfires and limit further loss of greater sage-grouse habitat. Restore native or desirable plants and create landscape patterns to benefit greater sage-grouse. In suitable habitat within greater sage-grouse Core Area, incorporate greater sage-grouse specific habitat objectives and apply appropriate seasonal restrictions for implementing vegetation management treatments in greater sage-grouse Core Area. Do not allow treatments in Core Area winter concentration areas unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality. Power wash all fire vehicles including engines, water tenders, personnel vehicles, and OHVs after they have been in the field to help to prevent the establishment or spread of invasive weeds.			
3013	FM: 1.2	Restrict the use of aerial applied fire retardant near identified rock art sites unless values at risk, such as human life and safety, require their use.			
3014	FM: 1.2	Use MIST for wildfire suppression where appropriate, with special consideration for areas of significant cultural resources or historic trails, areas with significant wildlife habitat or biological sensitivity and in areas of visual resource sensitivity unless human life or public safety is threatened.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
3015	FM: 1.1, 1.4	Full suppression is the most likely fire suppression strategy with other fire suppression strategies used on a case-by-case basis.	Full suppression of wildland fire is used within the WUI and to minimize critical resource damage. The use of unplanned ignition to achieve resource benefit is allowed on a case-by-case basis.	Full suppression of wildland fire is the most likely response throughout the planning area, with other suppression strategies used on a case-by-case basis. The use of unplanned ignition to achieve resource benefit is not allowed.	Full suppression of wildland fire is used within the WUI and in areas of high resource values including greater sage-grouse Core Area. A full range of wildland fire suppression tactics are allowed throughout the planning area, including the use of unplanned ignition to achieve resource benefit.
3016	FM: 1	Do not aerially apply fire retardants during suppression activities within 300 feet of any waterbody including those that support Yellowstone cutthroat trout, burbot, and sauger.	Same as Alternative A, plus do not authorize aerial or hand use of fire suppression foam within ¼ mile of waterbodies that support Yellowstone cutthroat trout, burbot, and sauger.	Same as Alternative A.	Do not aerially apply fire retardants during suppression activities within 300 feet of any waterbody. Do not apply fire retardants within 500 feet of waterways that support Yellowstone cutthroat trout, burbot, and sauger unless

3000 FIRE AND FUELS MANAGEMENT (FM)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					values at risk require the use of retardants within 500 feet from identified waterways.

Table 2.16. 4000 Biological Resources (BR) – Vegetation - General

4000 BIOLOGICAL RESOURCES (BR) – VEGETATION - GENERAL					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal BR: 1 Manage vegetation communities to restore, maintain, or enhance vegetation community health, composition, and diversity. Provide a mix of natural succession stages that incorporate diverse structure and composition into each vegetation type.</p> <p>Objectives:</p> <p>BR: 1.1 Maintain, improve, enhance, or restore habitat to facilitate the conservation, recovery, and maintenance of populations of native and desirable nonnative plant species.</p> <p>BR: 1.2 Maintain, improve, or enhance areas of ecological importance, priority plant species and habitats, and unique plant communities.</p> <p>BR: 1.3 Maintain, improve, or enhance sustainable forage levels for all grazing/browsing animals depending upon identified desirable vegetation communities.</p> <p>BR: 1.4 Utilize mechanical, chemical, and biological methods, including fire and livestock grazing, to achieve desirable vegetation communities.</p> <p>BR: 1.5 Manage grazing/browsing use levels in consideration of plant, riparian-wetland, and soil health requirements.</p> <p>BR: 1.6 Maintain, restore, and enhance aspen, forest, woodland, and non-sagebrush shrub communities for a healthy mix of successional stages. Emphasize stand diversity, sustainability, and consideration of other resources and uses in forest and woodland communities.</p> <p>BR: 1.7 Manage vegetation communities across the landscape to improve FRCC.</p> <p>BR: 1.8 Manage vegetative resources to optimize protection and recovery from drought, disease, insect infestations, and wildfire.</p> <p>BR: 1.9 Coordinate with local, state, and federal agencies and stakeholders to protect and recover vegetative resources and other habitat components affected by dry conditions, drought, disease, severe insect infestations, noxious weeds, and wildfires.</p> <p>Goal BR: 2 Maintain, enhance, or restore forest-stand community health, composition, and diversity to an ecologically appropriate mosaic considering factors such as density, basal area, canopy cover, age class, stand health, successional stages, and understory.</p> <p>Objectives:</p> <p>BR: 2.1 Limit infestation and epidemics in forests and woodlands as much as possible by managing for endemic populations of native insects, diseases, and pathogens.</p> <p>BR: 2.2 Maintain and protect characteristics and composition of mature forest and woodland communities with old growth characteristics.</p> <p>BR: 2.3 Improve opportunities to sustainably harvest forest products in identified areas while providing for other forest values and uses. Improve forest and woodland health to protect watershed values and support wildlife habitat requirements.</p>					

Table 2.17. 4000 Biological Resources (BR) – Vegetation - Forests, Woodlands, and Aspen Communities

4000 BIOLOGICAL RESOURCES (BR) – VEGETATION - FORESTS, WOODLANDS, AND ASPEN COMMUNITIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
4001	BR: 1, 1.2, 1.5, 2	Update and complete inventory of forests and woodlands, identifying characteristics such as areas of woodland encroachment, areas of unique or old growth characteristics or ecological significance, areas of damage from insect and disease, fuel loading within the WUI, general forest and woodland health, as well as areas suitable for commercial timber sales.			
4002	BR: 1.2	Manage forests and woodlands to improve stand diversity, sustainability, and consideration of other resources and resource uses while following Wyoming Silvicultural BMPs (Appendix H (p. 1521)).			
4003	BR: 1.9	Cooperate with other agencies, partners, adjacent landowners and other relevant parties to develop cooperative partnerships and implement landscape-wide, cross-boundary forest management within the South Pass, Lander Slope, Green Mountain, and Dubois Primary Forest Resource Areas (Map 47).			
4004	BR: 1.4	Identify areas in which wildland fire could be implemented as a management tool to enhance forest and woodland health.			
4005	BR: 1.6, 2	Actively promote aspen regeneration throughout the Lander Field Office using a variety of treatment methods to enhance wildlife habitat and improve overall ecological health.			
4006	BR: 2.1	Allow the sale of personal use permits to meet public demand for post and poles, firewood, sawlogs, Christmas trees, burlwood and other vegetative products consistent with forest health objectives and wildlife habitat requirements. After NEPA analysis, authorize commercial use for seed collections for use in habitat restoration or research.			
4007	BR: 1.1, 1.2, 2.1	Manage old growth and rare forest and woodland communities to maintain the ecological characteristics unique to the site(s).			
FORESTS AND WOODLANDS					
4008	BR: 1, 1.1, 1.2	Manage forests and woodlands in response to conditions on the ground, including forest health, wildlife habitat, and demand for forest products.	Manage forests and woodlands to improve vegetative health and for the benefit of other resources using natural processes to the greatest extent possible.	Manage forests and woodlands using all available treatment methods to maintain and improve forest health across the forested landscape and to provide forest products to the public.	Same as Alternative A.
4009	BR: 1.3, 2	Implement forest replanting after sale, vegetative treatment, or fire on a case-by-case basis if natural regeneration does not occur within a timeframe appropriate for vegetative type.	Implement forest replanting after sale, vegetative treatment, or fire on a case-by-case basis to benefit forest health and to improve carbon sequestration.	Implement forest replanting as soon as possible after sale, vegetative treatment, or fire on a case-by-case basis to more effectively sustain commodity production.	Same as Alternative A.

4000 BIOLOGICAL RESOURCES (BR) – VEGETATION - FORESTS, WOODLANDS, AND ASPEN COMMUNITIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4010	BR: 1.9	Authorize a variety of silvicultural techniques to protect resource values and maintain forest health.	Implement active silvicultural techniques only where natural processes are not able to accomplish forest and woodland health goals.	Authorize the full range of silvicultural techniques such as thinning and selective cuts and prescribed fire to maintain forest and woodland health and to reduce the risk of mortality by insects, disease, and wildfire.	Same as Alternative C.
4011	BR: 1.1, 1.2, 1.4, 1.8, 2.1	Allow clear-cuts within the following parameters: <ul style="list-style-type: none"> • Cannot exceed 25 acres in size • Cannot be within 100 feet of riparian-wetland areas • Cannot be on slopes greater than 45 percent 	Prohibit clear-cuts and harvest methods that create clear-cuts.	Authorize clear-cuts within the following parameters: <ul style="list-style-type: none"> • Can be of any size • Cannot be within 100 feet of riparian-wetland areas • Limit ground based logging systems to a maximum of 45 percent slope; any slope greater than 45 percent may be logged with cable systems or by helicopter 	Allow clear-cuts. Determine clear-cut size, location, and slope based on a combination of resource values and silvicultural objectives on a site-specific basis.
4012	BR: 1.2, 1.8, 1.9, 2.1	Manage forest insect and disease outbreaks on a case-by-case basis.	Manage forest insect and disease outbreaks only as necessary for human health and safety such as in areas around developed campgrounds and within the WUI.	Manage forest insect and disease outbreaks with the full range of silviculture techniques and treatment methods.	Same as Alternative A.
4013	BR: 1.1, 1.2, 2.1	Manage unique forest and woodland communities as they are identified on a case-by-case basis including some removal as appropriate.	Same as Alternative A, except manage all unique communities to maintain the ecological characteristics unique to the site.	Same as Alternative A.	Same as Alternative A, except ensure unique forests and woodland communities are managed to maintain the ecological characteristics unique to the site.
4014	BR: 1.3, 1.4, 1.5, 2	Manage forest product sales in the following areas on a case-by-case basis with the following restrictions and in response to local and regional market conditions (Map 47): <ul style="list-style-type: none"> • Lander Slope: Authorize 10 MMBF over a 5-year period followed by a 10-year period 	Develop forest management plans for the Green Mountain, South Pass, Lander Slope, and Dubois Primary Forest Resource Areas (Map 47) for forest product sales and management of pine beetle and other infestation. Lander Slope, Red Canyon, and South	Develop forest management plans for the Green Mountain, South Pass, Lander Slope, and Dubois Primary Forest Resource Areas for forest product sales and management for forest health and commercial production.	Develop a forest management plan for the Green Mountain Primary Forest Resource Area and as funding permits for the South Pass and Dubois Primary Forest Resource Areas (Map 47) for commercial and over-the-counter forest product sales, enhancement of forest health, addressing fuel

4000 BIOLOGICAL RESOURCES (BR) – VEGETATION - FORESTS, WOODLANDS, AND ASPEN COMMUNITIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		<p>of rest to enhance diversity and uneven age stand.</p> <ul style="list-style-type: none"> Red Canyon: Authorize forest product sales on a case-by-case basis to improve wildlife conditions. Limit aspen cuts to 5 acres in size and only allow to enhance stand health. Limit cuts of conifer stands to dead or dying trees to facilitate regeneration. South Pass: Authorize sales of small volumes of timber on a demand basis to remove dead or dying timber and to help regeneration. 	<p>Pass are managed as one area with the following restrictions:</p> <ul style="list-style-type: none"> Lander Slope: Prohibit forest product sales unless necessary because of human health and safety issues or to improve wildlife habitat and overall forest health. Red Canyon: Prohibit forest product sales unless necessary because of human health and safety issues or to improve wildlife habitat and overall forest health. South Pass: Prohibit forest product sales unless necessary because of human health and safety issues or to improve wildlife habitat and overall forest health. 		<p>loading within the WUI and management of pine beetle and other infestation.</p> <p>Manage the Lander Slope and Red Canyon as one area. Prohibit commercial forest product sales in this area unless necessary because of human health and safety issues (WUI) or to improve wildlife habitat and overall forest health.</p>

Table 2.18. 4000 Biological Resources (BR) – Vegetation - Grassland and Shrubland Communities

4000 BIOLOGICAL RESOURCES (BR) – VEGETATION - GRASSLAND AND SHRUBLAND COMMUNITIES					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
N/A	N/A	Note: Management actions to minimize disturbance to vegetation through application of Best Management Practices, mitigation, and reclamation practices for all surface-disturbing activities are in the Soil Reclamation section. Management actions for vegetation resources for the benefit of wildlife and special status species are located in those respective sections.			
4015	BR: 1.1, 1.3, 1.6	Manage for specific species and vegetative attributes (plant density, composition, cover, and diversity) using ecologically sustainable practices.			
4016	BR: 1, 1.1, 1.2	Manage grazing in sagebrush communities in accordance with the site’s ecological site description to accommodate the plant growth requirements of the larger cool season bunchgrasses such as needle and thread, bluebunch wheatgrass, green needlegrass, and Indian ricegrass.			
4017	BR: 1.2	Identify unique plant communities and manage to protect, preserve, or enhance these communities.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
4018	BR: 1, 1.1, 1.2, 1.3	Manage vegetation communities for vegetative attributes described in NRCS Ecological Site Guides and to meet identified vegetative goals.	Manage vegetation communities to benefit biological diversity including wildlife, fish, and special status species.	Manage vegetation communities to maximize forage production for the ecological site.	Same as Alternative A, plus when existing Ecological Site Descriptions have not been developed, are too general, or are not correct to serve adequately as benchmarks, identify and document local areas of similar potential within each specific ecological site that exemplify achievement of appropriate habitat objectives, and use these sites for the development of new reference sheets to be used as the benchmark reference. Establish measurable objectives related to greater sage-grouse habitat.
4019	BR: 1.4	On a case-by-case basis, use vegetation treatments to increase forage production when consistent with healthy rangeland ecosystems.	Use vegetation treatments to restore diversity of ecological sites and transitional states, and to benefit all resources.	Use vegetation treatments to change plant community composition in a manner that achieves rangeland health objectives and facilitates grazing management. Assure that projects conform to wildlife objectives, particularly with regard to greater sage-grouse.	Use vegetation treatments to change plant community composition in a manner that achieves wildlife objectives, rangeland health objectives, and facilitates grazing management. Assure that projects conform to resource objectives for the site.

Table 2.19. 4000 Biological Resources (BR) – Invasive Species and Pest Management

4000 BIOLOGICAL RESOURCES (BR) – INVASIVE SPECIES AND PEST MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal BR: 3 Manage for healthy native plant communities by reducing, preventing expansion of, or eliminating the occurrence of INNS, undesirable vegetation, or noxious weeds (predatory plant pests or disease) by implementing management actions consistent with goals included in Partners Against Weeds and consistent with state and local weed management plans.					
Objectives:					
BR: 3.1 Maintain adequate baseline information, inventory and monitoring, regarding the extent and control of invasive species to make informed decisions, evaluate effectiveness of management actions, and assess progress toward goals to improve invasive species management. Develop a prevention and early detection program.					
BR: 3.2 Coordinate with adjoining jurisdictions in management and control of INNS across jurisdictional and political boundaries.					
BR: 3.3 Include provisions for INNS management in all BLM-funded or authorized actions.					
Goal BR: 4 Support internal and external education and awareness of noxious weeds.					
Objective:					
BR: 4.1 Develop and deploy educational and public awareness programs and materials in cooperation with other agencies and organizations.					
Goal BR: 5 In all parts of the planning area, manage for the reduction, prevention, and halting the expansion of cheatgrass in the planning area. Emphasize the prevention of invasive annual grass and woody plants in greater sage-grouse Core Area.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
4020	BR: 3.1, 3.3	Cooperate with other federal and state agencies, counties, conservation districts, Weed and Pest Management Areas, and other entities to control weed infestation. Cooperate with APHIS and other stakeholders to control grasshoppers and Mormon crickets on BLM-administered lands in conjunction with control efforts initialized on adjoining non-federal lands.			
4021	BR: 3.1, 3.2, 3.3	Integrated pest management is consistent with Partners Against Weeds (BLM 1996). Use fire and mechanical/chemical treatments to control weeds. Reseed or replant as necessary to promote vegetative growth in consultation and cooperation with interested parties.			
4022	BR: 4	Develop and implement a program promoting public awareness of Wyoming Declared Noxious Weeds and Pests as well as INNS.			
4023	BR: 3.2, 3.3	Manage weed treatments to maintain and improve greater sage-grouse habitat. Apply Required Design Features and BMPs as COAs such as those in Appendix H (p. 1521).			
4024	BR: 3.2, 3.3	Require the use of certified noxious-weed free forage, mulch, and other land-applied products by BLM-authorized activities on BLM-administered lands.			
4025	BR: 3.3	Should INNS become established in a location, develop and implement site-specific plans to eradicate/control invasive weeds in all surface-disturbing activities in the immediate vicinity. Priority for control will be: (1) Wyoming Declared Weed and Pest Species, (2) those weeds on the Western States Combined Declared Noxious Weed List, (3) those annual/biennial invasive weeds interfering with reclamation efforts, and (4) those INNS interfering with a management objective.			

4000 BIOLOGICAL RESOURCES (BR) – INVASIVE SPECIES AND PEST MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4026	BR: 5	Develop a plan to manage cheatgrass in coordination with other agencies and individuals with the local (County) Weed & Pest Control Districts acting as the point of contact among all parties.			
4027	BR: 3.3	Require that all equipment and vehicles used for BLM-authorized activities be cleaned for seeds of noxious weeds and INNS before moving onto BLM-administered lands. Prohibit project vehicles accessing BLM-administered lands via cross-county travel from driving through infestations during access to the site. If the area on which BLM-authorized activities take place is identified as being a high risk for invasive and/or noxious weeds, require that vehicles be cleaned before leaving the worksite with prescriptions for the disposal of wash water.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
4028	BR: 3.3	Do not require livestock flushing to prevent the spread of INNS.	If the Authorized Officer determines that livestock are likely carrying ingested seeds of INNS, the Authorized Officer may require that livestock be flushed for weeds for a period of 72 hours before allowing livestock to move onto BLM-administered lands.	Same as Alternative A.	Same as Alternative B.
4029	BR: 3.3	Manage activities that contribute to the spread of noxious weeds on a case-by-case basis in accordance with factors identified in Executive Order 13112.	If the Authorized Officer determines that BLM-authorized activities are contributing to the spread of noxious or invasive species, adjust the terms of the authorized activity to aid in the control of the species.	Same as Alternative A.	Same as Alternative B.

Table 2.20. 4000 Biological Resources (BR) – Riparian-Wetland Resources

4000 BIOLOGICAL RESOURCES (BR) – RIPARIAN-WETLAND RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Note: Vegetation Goals BR: 1-2 apply to Riparian-Wetland Resources as well.					
Goal BR: 6 Maintain, enhance, or restore riparian-wetland areas to support biodiversity and provide the appropriate natural potential combination of vegetation, landform, or large woody debris to: (a) dissipate stream energy associated with high water flows or energies associated with wind and/or wave action and overland flow from adjacent sites, (b) reduce erosion and improve water quality, (c) filter sediment, (d) capture bedload, (e) allow for floodplain development, (f) improve floodwater retention and groundwater recharge, (g) develop root masses that stabilize stream banks, islands and shoreline features against cutting action, (h) allow for natural rates of water percolation, and (i) develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses.					
Objectives:					
BR: 6.1 Develop recovery management prescriptions for riparian-wetland areas that are not functioning properly and/or have impaired water quality.					
BR: 6.2 Develop management plans capable of ensuring riparian-wetland areas will achieve or exceed PFC.					
BR: 6.3 Manage all resources and resource uses to maintain, enhance, or restore riparian-wetland habitats.					
BR: 6.4 Maintain, enhance, or restore aquatic ecosystems including stream geomorphology.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
4030	BR: 6	Identify riparian-wetland management actions to promote biodiversity and develop an implementation plan to incorporate actions into BLM-authorized activities. Manage riparian-wetland areas and wet meadows to achieve or maintain diverse species richness that includes a component of perennial forbs in conjunction with desirable riparian sedges, rushes, bulrushes, and grasses, as appropriate.			
4031	BR: 6.1, 6.2, 6.3, 6.4	Implement identified management actions to have riparian-wetland areas meet or exceed PFC and Standard 2 of the Wyoming Standards for Healthy Rangelands.			
4032	BR: 6.4	Design utility line watercourse crossings to limit impacts to riparian-wetland areas.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

4000 BIOLOGICAL RESOURCES (BR) – RIPARIAN-WETLAND RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4033	BR: 6.2, 6.3, 6.4	Prohibit surface-disturbing activities within 500 feet of surface water, riparian-wetland areas, and playas unless activities are determined to be necessary and when impacts can be mitigated. Mineral and realty actions in these areas are managed with Category 4 restrictions (Map 5).	Prohibit surface-disturbing activities within 1,320 feet of surface water, riparian-wetland areas, playas, and 100-year floodplains, where mapped. Mineral and realty actions in these areas are managed with Category 4 restrictions (Map 5).	Same as Alternative A, unless on a site-specific basis a lesser distance is shown to provide equivalent protection of surface water, riparian-wetland areas, and playas.	Same as Alternative C in DDAs. Same as Alternative A in all other areas.
4034	BR: 6.1, 6.2, 6.3	On a case-by-case basis, use various site-specific management actions to make significant progress towards PFC including fencing, resting, deferred use, and road closures.	Use the natural healing capacity of the land to make significant progress towards PFC utilizing management actions such as road closures, lease stipulations, and livestock allotment management.	Use all management tools such as range improvement projects, travel management, and road construction, to make significant progress towards PFC.	Use all tools to make significant progress towards PFC including but not limited to making adjustments in livestock grazing such as season of use, rest/deferment, modification of the number of livestock, and installing range improvement projects designed to implement comprehensive livestock grazing strategies, travel management (i.e., road closures), and other authorizations.

Table 2.21. 4000 Biological Resources (BR) – Fish and Wildlife

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal BR: 7 Manage for the biological integrity and habitat function of terrestrial and aquatic ecosystems to sustain and optimize distribution and abundance of all native and desirable nonnative fish and wildlife species consistent with habitat capability.</p> <p>Objectives:</p> <p>BR: 7.1 Manage habitats to support WGFD in the attainment of big game herd unit objectives, fish management objectives, and well-distributed, healthy populations of fish and wildlife species consistent with the WGFD's Strategic Habitat Plan, State Wildlife Action Plan, and strategic population plans, and to achieve the stated purpose of designated WHMAs.</p> <p>BR: 7.2 Maintain habitats sufficient to fulfill the life-cycle requirements of diverse fish and wildlife species. Manage to protect important breeding and natal or parturition habitats for terrestrial and aquatic species.</p> <p>BR: 7.3 Maintain or improve habitat integrity, continuity, connectivity and productivity for fish and wildlife on a landscape scale.</p> <p>BR: 7.4 Provide barrier-free movement and habitat protection from disturbance and fragmentation in identified wildlife migration routes and fish passages.</p> <p>BR: 7.5 Maintain, restore, or enhance fisheries habitats so they achieve optimal channel geomorphology and vegetative structure for productivity and biological diversity.</p> <p>BR: 7.6 Provide healthy and stable ecosystems that support fish and wildlife habitat values, appropriate species' habitat needs, and the existing species' diversity.</p> <p>Goal BR: 8 Manage direct, indirect, and cumulative impacts to fish and wildlife and their habitats such that no unnecessary or undue degradation results from BLM actions and authorized activities.</p> <p>Objectives:</p> <p>BR: 8.1 In the absence of voluntary offsite mitigation or in areas with site-specific allowances, manage for no greater than a 10 percent net loss of acres of big game crucial winter range and parturition habitat over the life of the plan.</p> <p>BR: 8.2 Implement proactive management and conservation measures to prevent and/or reduce adverse impacts to wildlife and aquatic species.</p> <p>BR: 8.3 Coordinate with USDA Wildlife Services to avoid non-target species mortality and minimize other disturbances to fish and wildlife from predator control activities.</p> <p>BR: 8.4 Maintain and protect critical fish spawning, egg incubation, and fry areas.</p> <p>Goal BR: 9 Manage terrestrial and aquatic ecosystems to provide recreational and educational benefits and opportunities for the public,</p>					

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Objectives:</p> <p>BR: 9.1 Improve public awareness and support, including partnerships, for the conservation, restoration, and management of vegetation, fish, wildlife, and special status species programs.</p> <p>BR: 9.2 Work with partners to develop and provide fish, wildlife, and habitat outreach and educational materials to the public.</p> <p>BR: 9.3 Identify and provide opportunities for consumptive, non-consumptive or recreational use of fish and wildlife and their habitats.</p> <p>Goal BR: 10 Manage for quality habitats that would support the introduction, reintroduction, and augmentation of identified high priority fish and wildlife species on BLM-administered lands.</p> <p>Objective:</p> <p>BR: 10.1 Identify opportunities in coordination with stakeholders to introduce or reintroduce fish and wildlife species.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
4035	BR: 7.2	Choose and implement appropriate mitigation and Best Management Practices to minimize decreases in habitat function. Mitigate impacts as near to the impact, for the same or similar impacted species or habitats, as soon as possible. In cases where impacts cannot be mitigated to an acceptable level onsite or where the BLM and WGFD agree that mitigation or additional habitat protections farther away will be of greater benefit to wildlife, offsite mitigation will be considered. Apply the same conservation measures on split-estate lands unless, in the case of federal minerals, this would not be consistent with the surface owner's rights.			
4036	BR: 7.3	Minimize adverse impacts to fish and wildlife during the life of projects through project placement and maintenance of connectivity between large contiguous blocks of undisturbed habitat in cooperation with interested stakeholders. Require seasonal restrictions or other identified mitigation as needed to minimize impacts to migratory birds and their habitats protected by the Migratory Bird Treaty Act.			
4037	BR: 7.2	Prohibit surface-disturbing and disruptive activities within identified big game crucial winter range (Maps 50-54) from November 15 to April 30 and within identified big game parturition areas (Maps 50-54) from May 1 to June 30 unless an exception, waiver, or modification is granted by the Authorized Officer. Authorize exceptions for reclamation seeding when appropriate. Mineral and realty actions in these areas are managed with Category 1 restrictions, except as provided below.			
4038	BR: 8.2	Use an integrated management approach (mechanical, chemical, or biological treatments, prescribed fire, and grazing management techniques) to manipulate vegetative communities to achieve fish, wildlife, and watershed objectives.			
4039	BR: 7.3, 7.4	Remove or modify identified wildlife hazard fences that are adversely affecting wildlife where opportunities exist. Require wildlife escape ramps be installed in stock water troughs and tanks.			
4040	BR: 8.3	Coordinate BLM-authorized animal damage control with APHIS-Wildlife Services and other agencies using guidance provided by the existing MOU with APHIS.			
4041	BR: 8.1, 9.2, 9.3	Identify opportunities to develop wildlife viewing areas in cooperation with stakeholders.			

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4042	BR: 10.1	Cooperate with and provide support to WGFD, USFWS, and stakeholders in reintroducing native fish and wildlife species into historic or suitable ranges.			
4043	BR: 7.1	Cooperate with the WGFD to recommend adjustments to herd objectives in light of the habitat condition. Recommend wildlife use adjustments if monitoring data indicate that adjustments are necessary. Cooperate with WGFD to update and adjust seasonal range maps to incorporate new information/data.			
4044	BR: 7.5	Design, locate, and, where feasible, modify road crossings of streams to minimize impacts to fish populations and habitat.			
4045	BR: 7.6, 9.1, 9.2	Work cooperatively with stakeholders and local governments to develop and implement management strategies to prevent the introduction and spread of aquatic invasive species.			
4046	BR: 7.1	Manage habitat within the Whiskey Mountain bighorn sheep area in cooperation with the WGFD and the USFS as provided in the Special Designations section for the Whiskey Mountain ACEC.			
4047	BR: 7.1	Manage in accordance with the recommendations of the statewide Bighorn/Domestic Sheep Interaction Report and the 2012 WAFWA Recommendations for Domestic Sheep and Goat Management in Wild Sheep Habitat (WSWG 2012). Do not allow the use of domestic goats, llamas, etc., in Bighorn Sheep core Herd Units. Allow the use of domestic goats, llamas, etc. in the rest of the planning area where bighorn sheep are not present.			
4048	BR: 8.2	Avoid the movement of water from one drainage to another drainage to prevent aquatic invasive species and disease transfer. If equipment has been used in an area known to contain aquatic invasive species, the equipment will need to be inspected by an authorized aquatic invasive species inspector certified in the State of Wyoming prior to use in any water in the planning area. If aquatic invasive species are found, the equipment will need to be decontaminated following procedures found in Appendix H (p. 1521).			
4049	BR: 8.2	Require monitoring of impacts to wildlife from wind-energy development and apply appropriate mitigation.			
4050	BR: 7.6, 9.3	The Dubois, Red Canyon, Lander Slope, Green Mountain, greater sage-grouse Core Area, and the Sweetwater River watershed are priorities for management of fish and wildlife and their habitat. See the Special Designation-ACEC section for management alternatives.			
4051	BR: 7.2, 8.2	To minimize impacts to wildlife from oil and gas development, consider implementing recommendations found in WGFD document <i>Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats</i> (WGFD 2009a). To minimize impacts to wildlife from wind-energy development, consider implementing recommendations found in the WGFD document <i>Wildlife Protection Recommendations for Wind Energy Development in Wyoming</i> (WGFD 2010).			
MANAGEMENT ACTIONS BY ALTERNATIVE					
FISH					

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4052	BR: 8.4	Apply seasonal protections for surface-disturbing activities that would adversely impact fish spawning on a case-by-case basis. Mineral and realty actions in these areas are managed with Category 2 restrictions on a case-by-case basis (Map 49).	Apply seasonal protections for surface-disturbing activities within the floodplain or 1,000 feet (whichever is greater) of fish bearing streams to protect game and nongame fish species during spawning, egg incubation, and fry stages. Dates will vary by species and location. Mineral and realty actions in these areas are managed with Category 2 restrictions.	Do not apply seasonal protections for fish spawning. Mineral and realty actions in these areas are managed with Category 2 restrictions.	Apply timing limitations to surface-disturbing activities within water channels that will adversely affect spawning, egg incubation, and fry areas in fish-bearing streams. Spring spawning is protected March 15 to July 31 and fall spawning is protected September 15 to November 30. Dates may vary by species and location.
4053	BR: 8.4, 9.3	Manage human caused barriers to fish passage on a case-by-case basis.	Remove human caused barriers to fish passage where feasible to facilitate genetic diversity and population stability. Place barriers as needed to protect conservation populations of fish species from hybridization or competition. Build fish passages where necessary.	Same as Alternative A.	Same as Alternative A, plus remove barriers, build passages, or place barriers to protect conservation populations from hybridization or competition.
4054	BR: 7.5	On a case-by-case basis, authorize actions under the jurisdiction of the BLM that would result in the removal or depletion of water from fish bearing streams.	Prohibit new actions under the jurisdiction of the BLM that would result in the removal or depletion of water from fish bearing streams. Modify or remove existing projects that affect the sustainability of fish populations.	Same as Alternative A.	Same as Alternative A, unless authorized actions would result in the loss of a sustainable fish population. Existing projects that affect the sustainability of fish populations will be modified or removed on a case-by-case basis. For the protection of aquatic habitat and water quality, the area adjacent to Boysen State Park adjacent to Highway 20 is closed to oil and gas leasing.
GENERAL WILDLIFE					

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4055	BR: 7.1, 8.2	On a case-by-case basis, reduce the footprint of surface-disturbing activities and facilities to the smallest practical to protect wildlife and their habitats.	In all cases, minimize the footprint of surface-disturbing activities and facilities to the smallest practical to protect wildlife and their habitats.	Do not reduce the footprint of surface-disturbing activities and facilities to protect wildlife and their habitats.	To protect wildlife and their habitats, except when safety and maintenance issues are identified, reduce the footprint of surface-disturbing activities and facilities to the smallest size necessary to achieve the purpose for the disturbance. To protect wildlife and their habitat and other resource values, including cultural and visual resources, and to avoid conflict with the Westside Energy Corridor, the BLM-administered lands in Townships 40 and 41 North are closed to phosphate leasing. Other types of surface disturbance, such as mineral material sales, will be authorized only in consideration of these values.
4056	BR: 8.2	Wildlife seasonal protections for surface-disturbing and disruptive activities do not limit maintenance and operation actions unless specifically identified in project analysis.	Wildlife seasonal protections for surface-disturbing and disruptive activities also apply to maintenance and operation actions of a developed project when the activity is determined to be detrimental to wildlife.	Do not apply wildlife seasonal protections to maintenance and operation actions.	Outside of DDAs, wildlife seasonal protections from surface-disturbing and disruptive activities apply to maintenance and operations actions when the activity is determined to be detrimental to wildlife (see Appendix I (p. 1535)). Reclamation of surface disturbance will be in accordance with Appendix D (p. 1477) for non-DDA areas.

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4057	BR: 8.2	Do not avoid surface-disturbing activities in reptile hibernacula (den) sites.	For the protection of reptiles and their habitat, avoid surface-disturbing and disruptive activities within 1,000 feet of identified hibernacula (den) sites. Mineral and realty actions in these areas are managed with Category 3 restrictions.	Same as Alternative A.	For the protection of reptiles and their habitat, prohibit surface-disturbing activities within 200 feet of identified hibernacula (den) sites.
4058	BR: 7.3	Approve new fences and remove or modify existing fences on a case-by-case basis to address habitat fragmentation and big game migration corridors (Map 60).	Do not approve new fences (except for those necessary to exclude and/or protect wildlife or for human health and safety) and remove existing fences, when appropriate, to reduce habitat fragmentation and allow big game passage through migration corridors (Map 60).	Same as Alternative A.	Approve new fences on a case-by-case basis and do not construct fences across identified big game migration corridors unless fence is critical to the success of a Comprehensive Grazing Strategy that makes significant progress toward meeting the Wyoming Standards for Healthy Rangelands and adverse project impacts are mitigated. Look at opportunities to remove existing fences in migration corridors to manage for a no net gain of fences in corridors. Remove or modify existing fences to address habitat fragmentation and barriers to migration on a case-by-case basis. Type E fence will be required for any new or modified highway ROW fence except in those areas bordering domestic sheep allotments or in areas where another fence standard is preferable.
4059	BR: 7.4	On a case-by-case basis, close and reclaim redundant roads to reduce road density and habitat fragmentation.	Identify and close and/or reclaim unnecessary roads to reduce road density and habitat fragmentation.	Do not close and reclaim unnecessary roads.	Same as Alternative A, plus conduct in coordination with adjacent landowners and/or state and county governments.

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4060	BR: 8.1	Manage wind-energy development on a case-by-case basis in consideration of greater sage-grouse, raptor concentration areas, big game crucial winter range, migration corridors, and parturition areas.	Exclude wind-energy development in big game crucial winter range, migration corridors, and parturition areas, raptor concentration areas, and areas within 3 miles of greater sage-grouse leks, as identified.	Same as Alternative A.	Limit wind-energy development in greater sage-grouse Core Area to no more than one location per 640 acres and require that the cumulative disturbance from all sources is no more than 5 percent of sagebrush habitat within the project area. Until such time as research on impacts to greater sage-grouse is completed and adequate mitigation can be developed, greater sage-grouse Core Area will be closed to wind-energy development. Same as Alternative A in big game crucial winter range, migration corridors, and parturition areas, raptor concentration areas, and outside of greater sage-grouse Core Area.
BIG GAME					
4061	BR: 7.6	On a case-by-case basis, consider forage requirements for big game herd objectives when making forage allocations for livestock and wild horses.	Adjust livestock and wild horse forage allocations as needed to meet forage requirements for big game herd objectives.	Give priority to livestock forage needs when allocating vegetative resources.	Ensure that wildlife forage requirements are met for big game herd objectives when making forage allocations for livestock and wild horses.
4062	BR: 7.1	On a case-by-case basis, manage vegetation in identified crucial winter range and parturition areas to benefit the identified species (Maps 50-54).	In areas identified as crucial winter range and parturition areas, manage vegetation to benefit the identified big game species (Maps 50-54).	In areas identified as crucial winter range and parturition areas, manage vegetation to benefit all grazing/browsing animals (Maps 50-54).	Same as Alternative A.

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4063	BR: 8.2	On a case-by-case basis, authorize livestock water development projects in big game crucial winter range and parturition areas (Maps 50-54).	Prohibit livestock water development projects in big game crucial winter range and parturition areas (Maps 50-54).	Authorize livestock water development projects in big game crucial winter range and parturition areas (Maps 50-54).	Authorize livestock water development projects in big game crucial winter range and parturition areas (Maps 50-54) only if the project is critical to the success of a Comprehensive Grazing Strategy and project impacts are mitigated.
4064	BR: 8.1, 8.2	On a case-by-case basis, avoid authorizing road development in big game crucial winter range and parturition areas.	Prohibit road development in big game crucial winter range and parturition areas unless, on a case-by-case basis, it can be shown that there are no impacts to the species.	Do not limit BLM-authorized road development in big game crucial winter range and parturition areas except in those areas closed to surface-disturbing activities.	Same as Alternative A.
4065	BR: 8.2	Prohibit surface-disturbing and disruptive activities within identified elk winter range from November 15 to April 30 (Map 51). Mineral and realty actions in these areas are managed with Category 1 restrictions.	Same as Alternative A.	Surface-disturbing and disruptive activities within identified elk winter range are not subject to seasonal limitations.	Same as Alternative A, plus the seasonal protection is also for identified mule deer winter range. For the benefit of mule deer and their habitat, close the area in Townships 40 and 41 and the area south of Highway 28 near South Pass that is not part of an ACEC or the Hudson to Atlantic City to phosphate leasing.
RAPTORS					
4066	BR: 8.2	Prohibit surface-disturbing and disruptive activities within ¾ mile of active raptor nests except bald eagles (Map 62) from February 1 to July 31. Actual distances and dates may vary based on topography, species, season of use, and other pertinent factors. See Record 4072 for management of bald eagle nests.	Prohibit surface-disturbing and disruptive activities within 1½ miles of active raptor nests except bald eagle nests (Map 62) during the following time periods: <ul style="list-style-type: none"> February 1 to July 15: golden eagle, barn owl, red-tailed hawk, great-horned owl, other raptors March 1 to July 31: short-eared owl, long-eared owl, 	Same as Alternative B, except prohibit surface-disturbing and disruptive activities within ½ mile of active raptor nests except bald eagle nests (Map 62). See Record 4072 for management of bald eagle nests.	Prohibit surface-disturbing and disruptive activities within ¾ mile of active raptor nests, except ferruginous hawk nests where surface-disturbing and disruptive activities are prohibited within 1 mile, during the following time periods: <ul style="list-style-type: none"> February 1 to July 31 for all raptors except northern goshawk and burrowing owl

4000 BIOLOGICAL RESOURCES (BR) – FISH AND WILDLIFE					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<p>ferruginous hawk, peregrine falcon, screech owl</p> <ul style="list-style-type: none"> • April 1 to July 31: osprey, merlin, sharp-shinned hawk, kestrel, prairie falcon, northern harrier, Swainson's hawk, Cooper's hawk • April 1 to September 15 (or whenever the young have fledged): burrowing owl • April 1 to August 31: northern goshawk <p>See Record 4072 for management of bald eagle nests.</p>		<ul style="list-style-type: none"> • April 1 to August 31 for northern goshawk • April 1 to September 15 for burrowing owl <p>See Record 4072 for management of bald eagle nests.</p> <p>Distances and dates may vary based on raptor species, chick fledging, topography, and other pertinent factors.</p>

Table 2.22. 4000 Biological Resources (BR) – Special Status Species

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal BR: 11 Manage for the biological integrity and habitat function to facilitate the conservation, recovery and maintenance of populations of fish, wildlife, and plant special status species.					
Objectives:					
BR: 11.1 Protect or enhance areas of ecological importance for special status species. Manage for no net loss of habitat for any special status species.					
BR: 11.2 Conserve and recover special status species by determining and implementing strategies, restoration opportunities, use restrictions, and management actions.					
BR: 11.3 Manage specific environmental hazards, risks, and impacts in a manner compatible with special status species health.					
BR: 11.4 Identify habitat thresholds necessary to sustain well-distributed healthy populations of special status species to avoid future listings under the ESA.					
BR: 11.5 Develop and implement habitat management plans, activity plans, or use other mechanisms to protect high priority special status species.					
Goal BR: 12 Provide quality habitats to support the introduction, reintroduction, and augmentation of identified high priority fish, wildlife, and plant special status species.					
Objective:					
BR: 12.1 Identify opportunities in coordination with stakeholders to introduce or reintroduce special status species.					
Goal BR: 13 Maintain and/or increase greater sage-grouse abundance and distribution by conserving, enhancing or restoring the sagebrush ecosystem upon which populations depend, in cooperation with other conservation partners. Sustain the integrity of the sagebrush biome to provide the amount, continuity, and quality of habitat that is necessary to maintain sustainable populations of greater sage-grouse and other species by achieving the objectives below.					
Objectives:					
BR: 13.1 Maintain large patches of high quality sagebrush habitats with emphasis on patches occupied by greater sage-grouse.					
BR: 13.2 Maintain connections between sagebrush habitats, with emphasis on connections between habitats occupied by greater sage-grouse.					
Goal BR: 14 Identify the amount of habitat that should undergo restoration and/or rehabilitation during the life of the plan and initiate restoration and/or rehabilitation by achieving the objective below.					
Objective:					

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
BR: 14.1 Restore and/or reconnect large patches of sagebrush habitat with emphasis on reconnecting patches occupied by stronghold and isolated populations of greater sage-grouse.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
4067	BR: 11.2	Develop and implement protective measures for federally listed species in coordination with the USFWS. BLM will closely examine the applicability of categorical exclusions in priority habitat. If extraordinary circumstances review is applicable, BLM should determine whether those circumstances exist. BLM will continue to take action in cooperation with the USFWS to facilitate the recovery of threatened and endangered plant species that occur on BLM-administered land.			
4068	BR: 11.2	Require black-footed ferret surveys before authorizing surface-disturbing activities in prairie dog towns suitable as potential habitat for black-footed ferrets, unless cleared by the USFWS.			
4069	BR: 11.2, 11.5	Upon designation of special status species, identify distribution, key habitat areas, and special management needs to be used in developing activity plans. Apply appropriate Required Design Features and BMPs as COAs (such as those identified in Appendix H (p. 1521)) to reduce adverse impacts to special status species.			
4070	BR: 12.1	Coordinate with agencies, including state and local governments, in the restoration, reintroduction, augmentation, or reestablishment of threatened, endangered, and other special status species populations and/or habitats.			
4071	BR: 11.2	Implement appropriate conservation agreements, conservation measures, and BLM-endorsed management strategies for threatened, endangered, and other special status species. Comply with terms of the Statewide Programmatic Section 7 consultations (conservation measures from the letters of concurrence, biological assessments, and biological opinions) for management of threatened, endangered, proposed, and candidate species.			
4072	BR: 11.2	Implement conservation measures, terms and conditions, appropriate Best Management Practices, required design features and reasonable and prudent measures within existing state programmatic biological opinions for the bald eagle. Surface-disturbing and disruptive activities are prohibited within 1 mile of a bald eagle nest from February 1 to August 15.			
4073	BR: 11.2	To protect mountain plover habitat, including a ¼-mile buffer, prohibit surface-disturbing and disruptive activities from April 10 to July 10 unless surveys indicate the absence of breeding/nesting mountain plovers. Mineral and realty actions in these areas are managed with Category 1 restrictions.			
4074	BR: 11.2, 11.5	Develop site-specific measures for BLM-authorized activities to protect threatened, endangered, and sensitive species. Reduce the footprint of development and facilities to the smallest practical to protect special status species and their habitat. Incorporate Required Design Features and BMPs as COAs, such as those identified in Appendix H (p. 1521) as appropriate for authorized activities to address adverse impacts to special status species. Require seasonal restrictions or other identified mitigation as needed to minimize impacts to migratory birds and their habitats protected by the Migratory Bird Treaty Act.			
4075	BR: 11.2	Provide information to fire personnel to prevent fire suppression vehicles from staging in and driving over special status species plant populations. Currently, only the desert yellowhead population has been identified (Map 67).			
4076	BR: 11.1	Prohibit surface-disturbing and disruptive activities in greater sage-grouse winter concentration areas, as they are identified, from December 1 to March 14 unless data indicate a date modification is necessary to better protect wintering greater sage-grouse. Mineral and realty actions in these areas are managed with Category 1 restrictions.			

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4077	BR: 11.2	Maintain the current locatable mineral withdrawal for desert yellowhead critical habitat. Mineral and realty actions in this area are managed with Category 5 restrictions. Prohibit surface-disturbing activities and apply a NSO to mineral leasing activities within the Cedar Rim population of desert yellowhead.			
4078	BR: 11.1, 13.1, 13.2, 14.1	The Dubois area and Wyoming Governor’s greater sage-grouse Core Area (Map 63) are priorities for management of special status fish and wildlife species and their habitats.			
4079	BR: 13.1, 13.2, 14.1	Maintain sagebrush and understory diversity (relative to ecological site description) in seasonal greater sage-grouse and other sagebrush obligate species habitats unless such removal is necessary to achieve habitat management objectives. Vegetation treatments for greater sage-grouse would follow the “Wyoming Game and Fish Department Protocols for Treating Sagebrush to be Consistent with Wyoming Executive Order 2011-5; Greater Sage-Grouse Core Area Protection” (WGFD 2011) or the most current science available. See IM 2012-019 Attachment 6 or the most current guidance available.			
4080	BR: 13.1, 13.2, 14.1	Maintain seeps, springs, wet meadows, and riparian vegetation in a functional and diverse condition for young greater sage-grouse and other species that depend on forbs and insects associated with these areas. Restore lost riparian functioning systems by repairing abnormally incised drainages to raise water tables and increase water storage and brood-rearing habitats, within greater sage-grouse habitat.			
4081	BR: 11.2, 11.5	If the grizzly bear is delisted, manage habitat in accordance with the recommendations of the Wyoming Grizzly Bear Management Plan.			
4082	BR: 11.2	Discourage the use of broad-spectrum insecticides where insect control is required. Target pest control toward key problem areas and schedule applications to be the smallest amount effective in greater sage-grouse brood-rearing areas.			
4083	BR: 11.2, 11.3	In cooperation with stakeholders, design and locate fences so as not to disturb important greater sage-grouse habitat areas. Increase the visibility of existing fences to reduce hazards to flying greater sage-grouse. Require the installation of fence markers on new wire fences constructed in greater sage-grouse habitat to increase fence visibility and reduce collision potential.			
4084	BR: 11.2, 11.3	To minimize adverse impacts to greater sage-grouse from allowable uses, utilize recommendations from the following sources: “Grazing Influence, Management, and Objective Development in Wyoming’s Greater Sage-Grouse Habitat – With Emphasis on Nesting and Early Brood Rearing”; “Sage-Grouse Habitat Management Guidelines for Wyoming”; Studies in Avian Biology article “Ecology and Conservation of Greater Sage-Grouse: A Landscape Species and Its Habitats”; “WAFWA Greater Sage-Grouse Conservation Strategy” and additional information as it becomes available.			
4085	BR: 11.2, 11.3	Establish forage utilization levels in greater sage-grouse nesting habitat to ensure adequate residual cover remains.			
GENERAL SPECIAL STATUS SPECIES					
4086	BR: 11.2	On a case-by-case basis, require surveys for BLM sensitive species as part of authorizing actions. Require protective actions when appropriate.	Require surveys for presence of BLM sensitive species before authorizing surface-disturbing and disruptive activities. Authorize activities only if protective measures can mitigate or eliminate adverse impacts to species and their habitat.	Same as Alternative A.	Same as Alternative A.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4087	BR: 11.4, 11.5, 13.1, 13.2, 14.1	Limits on habitat loss for special status species are not addressed in the current RMP. Manage habitat loss for special status species on a case-by-case basis.	Establish limits of acceptable habitat loss including habitat modification, fragmentation, and loss of function for special status species.	Do not establish limits on habitat loss for special status species except as required to protect threatened and endangered species. Address habitat loss on a case-by-case basis.	Establish limits of acceptable cumulative habitat loss including habitat modification, fragmentation, and loss of function for special status species on a case-by-case basis. Limits of habitat loss and fragmentation for greater sage-grouse in Core Area are addressed in Record 4097.
SPECIAL STATUS PLANTS					
4088	BR: 11.3	Allow chemical vegetation treatments within identified habitat for BLM sensitive plant species on a case-by-case basis.	Prohibit chemical vegetation treatments within ¼ mile of habitat for BLM sensitive plant species unless the purpose is to protect or enhance sensitive species. Increased buffers to protect plant populations may be required on a case-by-case basis.	Allow chemical vegetation treatments within identified habitat for BLM sensitive plant species unless treatment would result in direct mortality of the plant population.	Allow chemical vegetation treatments within identified sensitive plant populations so long as treatments will benefit the population.
4089	BR: 11.2	Apply specific measures to protect known special status plant populations from BLM-authorized activities and motorized travel on a case-by-case basis.	Close areas with special status plant populations to motorized and mechanized travel. Mineral and realty actions in these areas are managed with Category 4 restrictions.	Allow surface-disturbing activities in areas with special status plant populations unless the activity would result in the loss of the population. Limit motorized travel to existing road and trails. Mineral and realty actions in these areas are managed with Category 1 restrictions.	Same as Alternative A, plus close desert yellowhead critical habitat to motorized and mechanized travel.
4090	BR: 11.2	On a case-by-case basis, require inventory of potential habitats for BLM sensitive plant species prior to authorizing activity. If a sensitive species is present, apply appropriate protective measures where possible.	Prohibit activities until the site is inventoried for BLM sensitive plant species and appropriate protective measures are applied.	Do not inventory for BLM sensitive plant species prior to authorizing activities. Apply appropriate protective measures on a case-by-case basis.	Same as Alternative A.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4091	BR: 11.2	Authorize range improvement projects in BLM sensitive plant species habitat on a case-by-case basis.	Prohibit range improvement projects within ½ mile of BLM sensitive plant species habitat unless a benefit to the plant species will be achieved.	Same as Alternative A.	Same as Alternative A, plus, as needed, buffer with the minimum distance necessary to protect population from grazing impacts.
SPECIAL STATUS FISH					
4092	BR: 11.2	Activities that could contribute sediment to waterbodies that support Yellowstone cutthroat trout, burbot, and sauger are authorized on a case-by-case basis.	Prohibit activities that could contribute sediment to waterbodies that support Yellowstone cutthroat trout, burbot, and sauger unless determined that additional sediment would benefit the species.	Authorize activities that could contribute sediment to waterbodies that support Yellowstone cutthroat trout, burbot, and sauger unless determined that additional sediment would result in species mortality.	Avoid activities that contribute sediment to waterbodies that support Yellowstone cutthroat trout, burbot, and sauger unless determined that additional sediment will not harm species or adequate mitigations can be applied.
SPECIAL STATUS WILDLIFE					
4093	BR: 11.2	Greater sage-grouse Core Area is open to oil and gas and geothermal leasing subject to standard stipulations including stipulations for the protection of greater sage-grouse.	Greater sage-grouse Core Area is closed to oil and gas and geothermal leasing.	Same as Alternative A.	Same as Alternative A, subject to the management actions described below and in the Special Designations section.
4094	BR: 11.2	Prohibit surface-disturbing and disruptive activities on or within ¼ mile of occupied greater sage-grouse leks (16,283 acres) (Map 63).	Prohibit surface-disturbing and disruptive activities on or within 0.6 mile of occupied or undetermined greater sage-grouse leks (93,411 acres) (Map 64).	Same as Alternative A.	Prohibit surface-disturbing or surface occupancy on or within a 0.6-mile radius of the perimeter of occupied greater sage-grouse leks in Core Area and on or within a ¼-mile radius of the perimeter of occupied greater sage-grouse leks outside Core Area unless greater sage-grouse or lek integrity would not be adversely affected, or unless an exception is granted pursuant to Appendix E (p. 1483) (Map 65). In Core Area, keep any new roads or road upgrades 1.9 miles from the perimeter of the lek.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4095	BR: 11.2	Avoid surface-disturbing and disruptive activities in greater sage-grouse nesting habitat within 2 miles of occupied leks (794,452 acres) from February 1 to July 31 (Map 63).	Avoid surface-disturbing and disruptive activities in greater sage-grouse nesting habitat within 3 miles of occupied leks (1,339,609 acres) from February 1 to July 31 (Map 64).	Same as Alternative A.	Prohibit surface-disturbing and/or disruptive activities from March 15 to June 30 in Core Area. Surface disturbance or disruption defined as notice-level activity pursuant to 43 CFR 3809.21 in Core Area during the period March 15 to June 30 is considered to be unnecessary or undue degradation unless the proponent is able to establish that it is not, based on site-specific information. Outside Core Area, prohibit surface-disturbing and/or disruptive activities from March 15 to June 30 within 2 miles of the perimeter of occupied leks (Map 65). Where credible data support different timeframes for these seasonal restrictions, dates may be expanded 14 days prior to or subsequent to the above dates.
4096	BR: 11.2	Avoid BLM-authorized human activity within ¼ mile of occupied greater sage-grouse leks (16,283 acres) between 8 p.m. and 8 a.m. from March 1 to May 15 on a case-by-case basis (Map 63).	Prohibit BLM-authorized human activity on or within 0.6 mile of perimeter of occupied or undetermined greater sage-grouse leks (93,411 acres) between one hour before sunset to one hour after sunrise from March 1 to May 15 unless activity is specific to inventorying, monitoring or viewing of greater sage-grouse (Map 64).	Avoid BLM-authorized human activity within ¼ mile of perimeter of occupied greater sage-grouse leks (16,283 acres) between 8 p.m. and 8 a.m. from March 1 to May 15 unless activity is specific to inventorying, monitoring or viewing of greater sage-grouse (Map 63).	Prohibit disruptive activities between 6 p.m. and 8 a.m. from March 1 to May 15 on or within 0.6-mile radius of the perimeter of occupied greater sage-grouse leks in Core Area (Map 65).

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4097	BR: 11.2	No similar action.	In identified greater sage-grouse breeding, nesting, and brood-rearing habitat, limit the density of disturbances to 1 per 640 acres and cumulative surface disturbance to less than or equal to 2.5 percent of the sagebrush habitat in the same 640 acres.	Do not limit the density of disturbances or acres of surface disturbance in identified greater sage-grouse breeding, nesting, and brood-rearing habitat.	In greater sage-grouse Core Area, limit the density of disturbances to an average of one oil and gas or mining location per 640 acres. The one location and cumulative value of existing disturbances will not exceed 5 percent of habitat. See IM 2012-019 or subsequent guidance with regard to disturbance calculations.
4098	BR: 11, 11.1, 11.2, 11.3, 11.4, 11.5,	No similar action.	If greater sage-grouse Core Area prescriptions, including limitations on surface disturbance, would prevent access to non-federal lands or valid rights existing at the time the ROD was signed, authorize construction of the required new ROW to the absolute minimum standard necessary to provide access. If the new disturbance for the ROW coupled with existing disturbance would exceed 2.5 percent of the area, the ROW would be contingent upon the ROW applicant securing mitigation to offset the disturbance.	Same as Alternative A.	If the new disturbance for a ROW in greater sage-grouse Core Area coupled with existing disturbance would exceed 5 percent (see IM 2012-019 or subsequent guidance with respect to disturbance calculations), then additional effective mitigation is necessary to offset the resulting loss of greater sage-grouse habitat. Interim reclamation following construction of the ROW and final reclamation following the relinquishment of the ROW will ensure reestablishment of the predisturbance greater sage-grouse habitat, with the reclamation bond amount set in consideration of this reclamation obligation.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4099	BR: 11.2, 11.3, 11.5	Major overhead powerlines are authorized on a case-by-case basis, except that ACECs are avoided for major ROWs.	Core Area is closed to major ROWs, except in designated corridors.	Core Area is open to major ROWs.	In Core Area, major overhead powerlines will not be authorized unless within 0.5 mile of an existing 115 kV or greater powerline or in a designated corridor authorized for overhead powerlines. Minor overhead powerlines will not be authorized unless adequate mitigation to protect greater sage-grouse is provided and the Authorized Officer determines that overhead installation has the fewest adverse impacts to greater sage-grouse.
4100	BR: 11.2, 11.3, 11.5	No similar action.	Core Area is closed to wind-energy development.	Same as Alternative A.	Until research on impacts of wind energy to greater sage-grouse is completed and adequate mitigation can be developed, exclude wind-energy development in Core Area.
4101	BR: 11.2	Allow livestock water development projects in greater sage-grouse nesting areas on a case-by-case basis.	Prohibit livestock water development projects in greater sage-grouse nesting areas (Map 64).	Allow livestock water development projects in greater sage-grouse nesting habitats.	Allow livestock water development projects in greater sage-grouse nesting habitat if the project will contribute to improved greater sage-grouse habitat, developments can be designed to be compatible with greater sage-grouse, and if they are part of a Comprehensive Grazing Strategy. When fences are authorized, require a design that has the fewest adverse impacts to greater sage-grouse including features to reduce greater sage-grouse strikes and mortality. Remove, modify, or mark fences in high-risk areas.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4102	BR: 11.2	Allow new high-profile structures within greater sage-grouse nesting habitats on a case-by-case basis.	Prohibit new, permanent, high-profile structures (higher than 12 feet) within 1 mile of occupied greater sage-grouse nesting habitat (Map 64). Mineral and realty actions in these areas are managed with Category 4 restrictions.	Allow high-profile structures within greater sage-grouse nesting habitats. Mineral and realty actions in these areas are managed with Category 1 restrictions.	New permanent, high-profile structures within greater sage-grouse nesting habitat will be allowed on a case-by-case basis. Require the installation of anti-perching devices on appropriate structures to reduce predation opportunities.
4103	BR: 11.2	Manage wind-energy development on a case-by-case basis in consideration of impacts to greater sage-grouse and its habitat.	Exclude wind-energy development in greater sage-grouse Core Area.	Same as Alternative A.	Same as Alternative A, but in conformity with Records 4060 and 4097. Until research on impacts of wind-energy development to greater sage-grouse is completed and adequate mitigation can be developed, exclude wind-energy development in greater sage-grouse Core Area.
4104	BR: 11.2	On a case-by-case basis, require facilities be located and noise levels of equipment be reduced to minimize the impacts of continuous noise on breeding and nesting greater sage-grouse.	Limit noise sources to 10 dBA above natural ambient noise measured at the perimeter of occupied greater sage-grouse leks.	Limit noise sources to 10 dBA above natural ambient noise measured at the perimeter of occupied greater sage-grouse leks from March 1 to May 15.	Same as Alternative C, unless scientific findings indicate a different noise level is appropriate. In addition, limit noise sources in other important greater sage-grouse habitats if research and/or policy indicates the need.
4105	BR: 11.3	To minimize raptor use, require anti-perching devices on new overhead powerlines and wind energy meteorological towers in greater sage-grouse, prairie dog, mountain plover, and pygmy rabbit habitats on a case-by-case basis.	Install anti-perching devices on all new overhead powerlines and on wind energy meteorological towers in greater sage-grouse, prairie dog, mountain plover and pygmy rabbit habitats. Work with ROW holders to install anti-perching devices on existing overhead powerlines in these habitats.	Same as Alternative A.	To minimize raptor use, require anti-perching devices on new overhead powerlines in greater sage-grouse Core Area. Require anti-perching devices on new overhead powerlines and wind energy meteorological towers in prairie dog, mountain plover, and pygmy rabbit habitats on a case-by-case basis. Work with ROW holders to install anti-perching devices on existing powerlines in these habitats.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4106	BR: 11.3	Allow above ground low voltage utility lines or require burying lines in greater sage-grouse, prairie dog, mountain plover, and pygmy rabbit habitats on a case-by-case basis.	Bury all new low voltage utility lines and high voltage utility lines where technologically feasible in greater sage-grouse, prairie dog, mountain plover, and pygmy rabbit habitats.	Same as Alternative A.	Same as Alternative A, plus evaluate and take advantage of opportunities such as the renewal of existing ROWs to remove or modify existing powerlines, prioritizing greater sage-grouse Core Area.
4107	BR: 11.2	On a case-by-case basis, avoid surface-disturbing activities in occupied pygmy rabbit habitats.	Prohibit surface-disturbing activities within 328 feet (100 meters) of suitable pygmy rabbit habitat.	Allow surface-disturbing activities in occupied pygmy rabbit habitats on a case-by-case basis.	Prohibit surface-disturbing activities within 200 feet of occupied pygmy rabbit habitat.
4108	BR: 11.2	Avoid surface-disturbing activities in occupied white-tailed prairie dog colonies where possible.	Prohibit surface-disturbing activities in all white-tailed prairie dog colonies.	On a case-by-case basis, avoid surface-disturbing activities in white-tailed prairie dog complexes larger than 100 acres.	Same as Alternative A.
4109	BR: 11.2, 11.3	Avoid surface-disturbing and disruptive activity impacts to bat maternity roosts and hibernation areas on a case-by-case basis.	Prohibit surface-disturbing and disruptive activities within ¼ mile of identified bat maternity roosts and hibernation areas that would adversely impact bats and their habitat.	Allow surface-disturbing and disruptive activities adjacent to or in bat maternity roosts and hibernation areas unless direct bat mortality would occur.	Same as Alternative B.
4110	BR: 11.1	Manage travel corridors for threatened and endangered species and BLM sensitive species on a case-by-case basis (Map 66). (Note: Only Canada lynx analysis units have been identified to date.)	Preserve traditional migration and travel corridors for all special status species as corridors are identified.	Preserve essential migration and travel corridors for threatened and endangered species as corridors are identified.	Same as Alternative A, plus manage permitted activities within travel corridors to avoid adverse impacts to sensitive species.

4000 BIOLOGICAL RESOURCES (BR) – SPECIAL STATUS SPECIES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4111	BR: 11.1	Mineral and realty actions in the Dubois area not included in an ACEC are managed as follows: <ul style="list-style-type: none"> ● Open to oil and gas leasing subject standard stipulations ● Open to geophysical exploration ● Open to phosphate leasing ● Open to locatable minerals ● Open to mineral material disposals ● Open to major ROWs ● Open to minor ROWs 	To protect the concentration of special status species and their habitats, mineral and realty actions in the Dubois area not included in an ACEC are managed as follows: <ul style="list-style-type: none"> ● Closed to oil and gas leasing ● Closed to geophysical exploration ● Closed to phosphate leasing ● Open to locatable minerals ● Closed to mineral material disposals ● Excluded to major ROWs ● Avoided for minor ROWs 	Same as Alternative A.	To protect the concentration of special status species and their habitats, mineral and major realty actions in the Dubois area not included in a WSA or an ACEC are managed as follows: <ul style="list-style-type: none"> ● Closed to oil and gas leasing ● Closed to geophysical exploration ● Closed to phosphate leasing ● Open to locatable minerals ● Closed to mineral material disposals unless entirely contained within the 120 acres located in T41N, R107W, Sec. 1 N1/2SE1/4.1 ● Excluded to major ROWs ● Avoided for minor ROWs
4112	BR: 11.2	On a case-by-case basis, adjust livestock grazing season of use dates to avoid conflict with grizzly bears.	Adjust livestock grazing season of use dates to avoid conflict with grizzly bears.	Same as Alternative A.	Same as Alternative A.

Table 2.23. 4000 Biological Resources (BR) – Wild Horses

4000 BIOLOGICAL RESOURCES (BR) – WILD HORSES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal BR: 15 Manage healthy wild horse herds within appropriate management levels that will maintain a thriving natural ecological balance between wild horse populations, wildlife, livestock, vegetation resources, and other resource values.					
Objectives:					
BR: 15.1 Adjust and maintain wild horse numbers and HMAs to comply with federal policies and applicable agreements with the State of Wyoming, including the August 2003 Consent Decree as applicable to the management situation.					
BR: 15.2 Maintain or enhance herd viability, genetic integrity, and unique characteristics that distinguish individual herds.					
BR: 15.3 Provide opportunities for viewing wild horses.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
4113	BR: 15.1	Conduct regular and periodic gathers when necessary to maintain a thriving natural ecological balance or when required by emergency to maintain the initial Appropriate Management Level ranges (number of horses) listed below. If NEPA analysis indicates a need for a change in the viable population of horses, Appropriate Management Levels may be changed without an amendment to the RMP. <ul style="list-style-type: none">• Antelope Hills/Cyclone Rim: 60-82• Conant Creek: 60-100• Crooks Mountain: 65-85• Dishpan Butte: 50-100• Green Mountain: 170-300• Muskrat Basin: 160-250• Rock Creek Mountain: 50-86			
4114	BR: 15.1, 15.2	Utilize chemical and other population control measures as needed to maintain Appropriate Management Level ranges.			
4115	BR: 15.1	Gather wild horses outside the established HMAs during routine periodic gathers (Map 68). Prioritize gathers in greater sage-grouse Core Area unless removals are necessary in other areas to prevent serious environmental issues, including herd health impacts. Utilize Required Design Features and BMPs (such as those in Appendix H (p. 1521)) as COAs to promote genetic diversity and limit adverse impacts to wild horses from gathers.			
4116	BR: 15.2	Employ selective removal criteria during periodic gathers to increase desired genotype and phenotype.			
4117	BR: 15.1	Utilize monitoring and evaluation data to assess habitat and populations within HMAs.			
4118	BR: 15.1	Conduct animal health monitoring.			
4119	BR: 15.1	Manage the North Lander four herds as one herd to promote good distribution, but maintain separate horse Appropriate Management Levels in existing HMAs.			
4120	BR: 15.1	Maintain sufficient year-round water sources to sustain wild horses. Evaluate all proposed range improvement projects to benefit wild horses for impacts to other resources and uses.			

4000 BIOLOGICAL RESOURCES (BR) – WILD HORSES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
4121	BR: 15.1	Update the Herd Management Area Plan as needed to meet herd health objectives, including Appropriate Management Levels, and to address impacts to other resources. Consider forage competition and evaluate overall utilization levels by all grazing animals and incorporate greater sage-grouse habitat management objectives.			
4122	BR: 15.1	Manage wind-energy development within wild horse HMAs and adjacent lands so as not to preclude the ability to manage wild horses within the HMAs.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
4123	BR: 15.3	Do not establish scenic loops for viewing wild horses.	Establish scenic loops for viewing wild horses in some or all of the following areas (Map 68): <ul style="list-style-type: none">• Antelope Hills to Cyclone Rim• Green Mountain Herd Area• Muskrat Basin to Dishpan Butte	Same as Alternative B.	Same as Alternative B, but limit road improvements to those necessary for public safety keeping as small a footprint as possible. Encourage primitive recreation and outfitters to add wild-horse viewing opportunities. Identify locations for web cams or electronic viewing opportunities, to expand opportunities to view wild horses from a distance. Partner with state and local tourism promoters to encourage wild-horse viewing.
4124	BR: 15.1, 15.2	Consider impacts on herd health, including genetic diversity, when making management decisions regarding fencing.	Remove or modify existing fences to allow free movement among herd populations.	Same as Alternative A.	Same as Alternative A, plus remove or modify existing fences to allow free movements among herd populations as opportunities arise.

Table 2.24. 5000 Heritage Resources (HR) – Cultural Resources

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal HR: 1 Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations (FLPMA, Section 103(c), 201(a) and (c); NHPA, Section 110(a); ARPA, Section 14(a)).</p> <p>Objectives:</p> <p>HR: 1.1 Compile a record of known cultural resources in the Lander Field Office and assign those resources to appropriate uses. Manage each type of cultural resource according to their proper use allocation, and monitor those resources’ condition and use.</p> <p>HR: 1.2 Maintain a representative sample of each cultural resource type for future generations.</p> <p>Goal HR: 2 Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses (FLPMA Section 103(c), NHPA 106, 110 (a)(2)) by ensuring that all authorizations for land use and resource use will comply with the NHPA Section 106.</p> <p>Objectives:</p> <p>HR: 2.1 Develop activity plans or project/site-specific treatment plans or other protective measures for significant cultural resources at risk from deterioration or adverse effects from other uses (e.g., Beaver Creek Oil and Gas Unit). Coordinate with other BLM programs to prevent potential conflicts before they are allowed to occur.</p> <p>HR: 2.2 Consult with Native American tribal governments regarding proposed land uses having the potential to affect cultural resources identified as having tribal interests or concerns. Determine the types of resources of concern to various tribes, and take tribal views into consideration when making land use allocations or decisions.</p> <p>Goal HR: 3 Protect significant cultural resources while endeavoring to minimize economic and social impacts to private landowners and local communities.</p> <p>Objectives:</p> <p>HR: 3.1 Consult and coordinate with affected landowners and local communities when devising protection measures for cultural resources.</p> <p>HR: 3.2 Consult and coordinate with affected landowners and local communities when devising recreational use plans for cultural resources.</p> <p>Goal HR: 4 Maintain existing and establish new working relationships with Native American tribes for purposes of advancing the protection of cultural resources.</p> <p>Objective:</p> <p>HR: 4.1 Consult, as appropriate, with Native Americans to identify tribally-sensitive resources or places that may be present within the Lander Field Office. Safeguard all information considered by tribes to be confidential, and utilize the information to prevent conflicts with incompatible uses.</p>					

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal HR: 5 Promote stewardship, conservation, and appreciation of cultural and paleontological resources.</p> <p>Objectives:</p> <p>HR: 5.1 Maintain and enhance programs that provide opportunities for scientific research of cultural and paleontological resources. Develop relationships and cooperative agreements with the University of Wyoming and other research institutions.</p> <p>HR: 5.2 Provide opportunities for public education, interpretation, and scientific research of cultural and paleontological resources. Continue Project Archeology teaching courses, and continue to conduct public presentations for schools, community organizations, and the public. Provide for appropriate interpretation of sites of high public interest. Provide selected cultural and paleontological resources for scientific research.</p> <p>HR: 5.3 Preserve and stabilize significant cultural and paleontological resources, especially resources that face immediate threat, and/or historic structures in high public use areas.</p> <p>HR: 5.4 Pursue establishment of site stewardship programs at vulnerable cultural sites, e.g., the Castle Gardens Rock Art Site.</p> <p>Goal HR: 6 Preserve and protect the historical remains and historical settings of the Oregon, Mormon Pioneer, California, and Pony Express NHTs. See the Congressionally Designated Trails section for management alternatives for these resources. If they are not designated as an ACEC then management actions for them will be analyzed in this (5000 – Heritage Resources) section.</p> <p>Goal HR: 7 Preserve and protect the historical remains and historical settings of intact portions of the Warm Springs Canyon Flume.</p> <p>Objectives:</p> <p>HR: 7.1 Coordinate with operations and other programs to stabilize and/or repair suitable portions of the Flume.</p> <p>HR: 7.2 Establish appropriate management prescriptions to maintain or improve the historic and physical integrity of the Flume and its settings.</p> <p>HR: 7.3 Ensure recreation use in the area near the Flume will be compatible with private landowner concerns and historical values.</p> <p>Goal HR: 8 Preserve and protect the historical remains and historical settings of the South Pass Historic Mining Area and associated sites, including Miner’s Delight and South Pass City. See the Areas of Critical Environmental Concern section for management alternatives for these resources. If they are not designated as ACEC then management actions for them will be analyzed in this (5000 – Heritage Resources) section.</p> <p>Goal HR: 9 Preserve and protect the historical remains and historical settings of other significant trails and roads, including intact portions of the Bridger Trail; the Rawlins-Fort Washakie, the Casper-Lander, the Green River to Fort Washakie, the Point of Rocks to South Pass, and the Birdseye Pass Stage Trails; and the Yellowstone/National Park to Park Highways. See the Areas of Critical Environmental Concern section for management alternatives for these resources. If they are not designated ACECs, then management actions for them will be analyzed in this (5000 – Heritage Resources) section.</p>					

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal HR: 10 Preserve and protect the prehistoric remains and natural settings of the Castle Gardens Rock Art Site. See the Areas of Critical Environmental Concern section for management alternatives for these resources. If they are not designated ACECs, then management actions for them will be analyzed in this (5000 – Heritage Resources) section.</p> <p>Goal HR: 11 Preserve and protect the cultural remains and natural settings of Cedar Ridge Traditional Cultural Property. See the Areas of Critical Environmental Concern section for management alternatives for these resources. If they are not designated ACECs, then management actions for them will be analyzed in this (5000 – Heritage Resources) section.</p> <p>Goal HR: 12 Preserve and protect the cultural remains and natural settings of Sacred, Spiritual, and/or Traditional Cultural Properties.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
5001	HR: 1	Identify representative samples of cultural resource types (prehistoric and historic) from each Archeological Study Unit, and protect and preserve them for appreciation by future generations.			
5002	HR: 4.1	Continue existing relationships and develop new relationships with Native American tribes, in order to identify sites, areas, and resources important to them. Document and keep confidential important sites, areas, and resources, as appropriate. Incorporate the information into the planning system, to identify conflicts in the earliest stages, and to avoid conflicts whenever possible. Manage identified areas of tribal importance to minimize disturbance to them and to ensure continued access.			
5003	HR: 4.1	Ensure that areas important to Native American communities are not transferred from federal ownership, physically modified, or affected by management actions in ways that restrict or deny access and/or use.			
5004	HR: 4.1	Protect and manage sites that are eligible for or listed on the NRHP (Map 69). Manage sites allocated for conservation, traditional use, or public use to avoid adverse effects; manage sites allocated for scientific or experimental use for their research potential. Protect and manage NHLs, NHTs, and NNLs through management of non-compatible uses.			
5005	HR: 1.1, 2.1	Identify areas of significant prehistoric cultural resources that are at high risk from development, as data becomes available.			
5006	HR: 3.1, 3.2	In cooperation with local government and stakeholders (including Fremont County entities such as the Museums Board and the Historic Preservation Board), consider the economic and social effects of protecting cultural resources. Coordinate with affected landowners, local communities, and agencies on any decisions that could affect their use or operations. Consistent with cultural resource protection goals and objectives, devise management actions that do not adversely affect the objectives of private landowners or local communities.			
5007	HR: 12	Manage sacred, spiritual, and/or traditional cultural properties as they are identified.			
5008	HR: 12	Limit motorized travel to existing or designated roads and trails in the areas around sacred, spiritual, and/or traditional properties.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
5009	HR: 2.1	<p>Allow BLM-authorized activities to proceed in accordance with current Wyoming State Protocol and NHPA regulations.</p> <p>For cultural resources significant for their information potential, require the recovery of scientific data if an activity would cause adverse effects. For cultural resources significant for reasons other than information potential, require detailed documentation.</p>	<p>Allow BLM-authorized activities to proceed in accordance with current Wyoming State Protocol and NHPA regulations, with an emphasis on avoiding National Register-eligible properties (Map 69).</p>	<p>Allow BLM-authorized activities to proceed in accordance with current Wyoming State Protocol and NHPA regulations.</p> <p>Allow development to proceed by imposing the minimum restrictions required by regulation on activities that could cause adverse effects to National Register-eligible properties.</p>	<p>Allow BLM-authorized activities to proceed in accordance with RMP decisions and current Wyoming State Protocol and NHPA regulations.</p> <p>For cultural resources significant for their information potential, require avoidance whenever possible. If avoidance is not possible, require the recovery of scientific data if an activity would cause adverse effects. For cultural resources significant for reasons other than information potential, require avoidance whenever possible; if avoidance is not possible, require detailed documentation.</p>
5010	HR: 2.1, 6	<p>On a case-by-case basis for Significant (see Glossary) cultural resources, implement appropriate viewshed protections, limit degradation, promote educational opportunities, and limit effects from development and BLM-authorized activities.</p> <p>Continue to preserve and stabilize significant sites known to be in danger of degradation or as brought to the attention of the BLM.</p>	<p>Conduct assessments in areas where cultural resources are threatened by development or are known to be in danger of degradation. Identify and prioritize endangered sites and apply the following management:</p> <ul style="list-style-type: none"> Sites where the historic setting is important: implement landscape or viewshed-wide protections of cultural resources and limit degradation of the historic setting. Sites include the NHTs, RHT&EHs, Castle Gardens, South Pass Historic Mining Area, Warm Springs Canyon Flume, sacred sites, and Cedar Ridge. 	<p>Same as Alternative A, except impose the minimum restrictions required by regulation on activities that could cause adverse effects to National Register-eligible properties.</p>	<p>Same as Alternative A.</p>

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<ul style="list-style-type: none"> Sites threatened with degradation: develop funding for conservation of sites, working in cooperation with interested partners. Sites include the NHTs, RHT&EHs, Castle Gardens, South Pass Historic Mining Area, and Warm Springs Canyon Flume. 		
5011	HR: 2.2	Consult with tribes when specific projects may have the potential to adversely affect resources important to them. Consider tribal views when uses threaten these sites and protect tribally important sites, areas, and resources whenever possible.	Same as Alternative A, plus conduct ethnographic research to identify sensitive sites throughout the Lander Field Office. Protect all tribally important sites. Develop standards for programmatic management based on the type of site.	Same as Alternative A, except that in areas where protection would conflict with other uses, impose the minimum restrictions required by regulation on activities that could cause adverse effects to National Register-eligible properties.	Same as Alternative A.
5012	HR: 5.1	Continue cooperative agreements with the University of Wyoming to make mitigation and research projects more timely and cost-effective.	Same as Alternative A, plus establish cooperative relationships with other partners to increase scientific research of cultural and paleontological resources.	Same as Alternative A.	Continue cooperative agreements with the University of Wyoming to make mitigation and research projects more timely and cost-effective. Establish cooperative relationships with other partners to increase scientific research of cultural resources when opportunities arise.
5013	HR: 1.1	Conduct inventories for cultural resources prior to all surface-disturbing activities.	Same as Alternative A, except use Class I Regional Overview to proactively identify areas of high, medium, and low probability for the discovery of cultural sites. Conduct non-project specific Class III inventories in areas of high development potential and of high probability for cultural resource sites.	Same as Alternative A.	Same as Alternative A.
SPECIFIC CULTURAL RESOURCES					
See the Special Designations section for management alternatives for cultural resources that are managed or are nominated for management as Special Designations.					

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
WARM SPRINGS CANYON FLUME, NATURAL BRIDGE, AND GEYSER					
5014	HR: 7.1, 7.2, 7.3	Manage the Warm Springs Canyon Flume site (557 acres) (Map 69) to protect the site as a National Register-eligible property.	Manage the Warm Springs Canyon Flume site and surroundings (834 acres) (Map 69) to protect the area as a National Register-eligible property.	Same as Alternative A.	Manage the Warm Springs Canyon Flume site (557 acres) and the area around it (Map 69) to protect and stabilize the area as a National Register-eligible property.
5015	HR: 7.3	Mineral and realty actions in the 557-acre Warm Springs Canyon Flume Site area are managed with Category 5 restrictions. Mineral and realty actions in the remainder of the area (277 acres) are managed with Category 2 restrictions.	Mineral and realty actions in the 834-acre Warm Springs Canyon Flume Site are managed with Category 6 restrictions.	Mineral and realty actions in the 557-acre Warm Springs Canyon Flume Site are managed with Category 1 restrictions.	Mineral and realty actions in the 557-acre Warm Springs Canyon Flume Site are managed with Category 5 restrictions. Mineral and realty actions in the remainder of the area (277 acres) are managed with Category 4 restrictions.
5016	HR: 7.2	The Flume area is available for livestock grazing, subject to standard Protocol and NHPA measures to protect the site.	Same as Alternative A, except do not authorize new range improvement projects within the 834 acres.	Same as Alternative A.	The Flume area is available for livestock grazing, but prohibit activities that could result in damage to the flume.
5017	HR: 7.2	Limit motorized travel to existing roads and trails.	Limit motorized travel to designated roads and trails.	Same as Alternative A.	Same as Alternative A.
5018	HR: 7.2	Develop a cultural resource management plan for the Flume, including stabilization of selected segments of the Flume.	Same as Alternative A, plus manage the Flume and surroundings in cooperation with USFS and nearby landowners to better preserve the property.	Same as Alternative A.	Same as Alternative B.
SACRED, SPIRITUAL, and/or TRADITIONAL CULTURAL PROPERTIES					

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
5019	HR: 12	Mineral and realty actions are subject to the following restrictions (1,118 acres): <ul style="list-style-type: none"> • 0 to ¼ mile from a property is managed with Category 3 restrictions. • The area beyond ¼ mile from a property is managed with Category 1 restrictions and subject to standard Protocol and NHPA measures. 	Mineral leasing, mining, and realty actions are subject to the following restrictions (60,700 acres): <ul style="list-style-type: none"> • 0 to 3 miles from a property is managed with Category 4 restrictions. • The area beyond 3 miles from a property is managed with Category 1 restrictions and subject to standard Protocol and NHPA measures. 	Same as Alternative A.	Mineral leasing, mining, and realty actions in the established protection zones around the following sites [48FR301 (2,940 acres), 48FR311 (555 acres), 48FR3997 (1,045 acres), 48FR4070 (3,378 acres), 48FR4489 (930 acres)], 48FR773 (588), 48FR6125 (770 acres), new sacred sites as they are identified and then verified by tribes and the BLM, are managed with the following restrictions (10,206 total acres): <ul style="list-style-type: none"> • Open to oil and gas leasing subject to NSO stipulations • Open to geophysical exploration • Closed to solid mineral leasing • Open to locatable minerals • Closed to salable minerals • Excluded to major ROWs • Avoided for minor ROWs
5020	HR: 12	Properties are available for livestock grazing, subject to standard Protocol and NHPA measures to protect them.	Same as Alternative A, except do not authorize new range improvement projects within 2 miles of each property.	Same as Alternative A.	Sites listed in Record 5019 are available for livestock grazing, but prohibit new range improvement projects within the site protection zones unless these projects are designed to protect the sites. Consult with grazing permittees on extent of site protection areas.
5021	HR: 1, 7	Develop cultural resource management plans for each property as time and funding permit.	Develop cultural resource management plans for each property in consultation with affected tribes. Complete ethnographic studies, archeological surveys, and	Same as Alternative A.	Same as Alternative A.

5000 HERITAGE RESOURCES (HR) – CULTURAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			stewardship programs to better manage the properties.		

Table 2.25. 5000 Heritage Resources (HR) – Paleontological Resources

5000 HERITAGE RESOURCES (HR) – PALEONTOLOGICAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal HR: 13 Locate, evaluate, manage, and protect, where appropriate, paleontological resources on BLM-administered lands.</p> <p>Objectives:</p> <p>HR: 13.1 Compile a record of known paleontological resources in the Lander Field Office and assign those resources to appropriate uses. Manage each type of paleontological resource according to their proper use allocation, and monitor those resources' condition and use.</p> <p>HR: 13.2 Maintain a representative sample of each paleontological resource type for future generations.</p> <p>Goal HR: 14 Facilitate the appropriate scientific, educational, and recreational uses of paleontological resources, such as research and interpretation.</p> <p>Objectives:</p> <p>HR: 14.1 Develop management recommendations to promote the scientific, educational, and recreational uses of paleontological resources.</p> <p>HR: 14.2 Continue to work closely with paleontological researchers who carry permits to scientifically survey, collect, and excavate fossil resources on BLM-administered lands.</p> <p>Goal HR: 15 Ensure that proposed land uses, initiated or authorized by the BLM, do not inadvertently damage or destroy important paleontological resources on BLM-administered lands.</p> <p>Objectives:</p> <p>HR: 15.1 Utilize the BLM PFYC system to assess possible resource impacts and mitigation needs for federal actions.</p> <p>HR: 15.2 Require surveys, monitoring, and excavation where appropriate to identify and protect important paleontological resources from surface-disturbing activities.</p> <p>Goal HR: 16 Foster public awareness and appreciation of our nation's rich paleontological heritage.</p> <p>Objectives:</p> <p>HR: 16.1 Maintain and enhance programs that provide opportunities for scientific research of paleontological resources. Develop relationships and cooperative agreements with the University of Wyoming and other research institutions.</p> <p>HR: 16.2 Provide opportunities for public education, interpretation, and scientific research of paleontological resources. Provide for appropriate interpretation of sites of high public interest. Provide selected paleontological resources for scientific research.</p>					

5000 HERITAGE RESOURCES (HR) – PALEONTOLOGICAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
HR: 16.3 Preserve and stabilize significant paleontological resources, especially resources that face immediate threat, and/or paleontological localities in high public use areas.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
5022	HR: 13.1, 15.1, 15.2	Mineral and realty actions in areas with “very high” or “high” PFYC (Map 70) are managed with Category 2 restrictions. When disturbing formations considered to have “very high” or “high” PFYC, survey and/or monitor for the discovery of significant paleontological resources. Protect paleontological resources which are considered to be significant (vertebrate fossils and invertebrate or plant fossils considered scientifically important by professional paleontologists) from the effects of development projects. Protection also includes data recovery through scientific collection or excavation, and/or protection/stabilization. Develop special management plans for areas of unusual or concentrated significant paleontological resources.			
5023	HR: 13.2, 15.1, 15.2, 16.1, 16.3	Protect significant paleontological resources from natural degradation and from non-project human-caused damage. Continue to protect significant fossil localities suffering from natural weathering and erosion through collection efforts. Continue to protect significant localities suffering from vandalism through physical and administrative measures.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
5024	HR: 13.2, 15.1, 15.2, 16.1, 16.3	Allow standard development and BLM-authorized activities to proceed in accordance with resource protections identified in regulations and guidelines. For significant paleontological resources, require the recovery of scientific data if an activity would cause adverse effects.	Same as Alternative A, plus identify resources that would be useful for public interpretation and pursue funding to allow visitation and interpretation.	Same as Alternative A.	Same as Alternative B.
5025	HR: 16.1, 16.2, 16.3	On a case-by-case basis for significant paleontological resources, limit degradation, promote educational opportunities, and limit impacts from development and BLM-authorized activities. Continue to preserve and stabilize significant fossil localities known to be in danger of degradation or as brought to the attention of the BLM.	Same as Alternative A, plus conduct inventories in areas where paleontological resources are threatened by development or are known to be in danger of degradation. Identify and prioritize endangered sites and apply the following management: <ul style="list-style-type: none">Localities threatened by development: implement protections based on level of threat and importance of resource; prohibit development where needed.	Same as Alternative A.	Same as Alternative A, plus conduct inventories in areas where significant paleontological resources are known to be threatened by development or to be in danger of degradation. Identify and prioritize endangered sites and apply the following management: <ul style="list-style-type: none">Significant localities threatened by development: implement protections based on level of threat and importance of resource;

5000 HERITAGE RESOURCES (HR) – PALEONTOLOGICAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<ul style="list-style-type: none"> Localities with educational potential: work cooperatively to protect these areas from degradation; develop and improve educational values of these localities. Sites threatened with degradation: develop funding for conservation of paleontological localities, working in cooperation with interested partners. 		<p>prohibit development where needed.</p> <ul style="list-style-type: none"> Significant localities with educational potential: work cooperatively to protect these areas from degradation; develop and improve educational values of these localities. Significant localities threatened with natural deterioration: develop funding for conservation of paleontological localities, working in cooperation with interested partners.
5026	HR: 14.2, 16.3	Continue cooperative relationships with the University of Wyoming and other institutions to make mitigation and research projects more feasible.	Same as Alternative A, plus establish cooperative relationships with other partners to increase scientific research of paleontological resources.	Same as Alternative A.	Continue cooperative relationships with the University of Wyoming and other institutions to make mitigation and research projects more feasible. Establish cooperative relationships with other partners to increase scientific research of paleontological resources where opportunities arise.
5027	HR: 13.1, 15.1, 15.2	Conduct inventories for paleontological resources in areas with “very high” and “high” PFYC prior to all surface-disturbing activities.	Same as Alternative A, plus pursue more detailed analyses of the planning area to further identify areas of high potential for significant paleontological resources.	Same as Alternative A.	Prior to surface-disturbing activities, conduct inventories in areas with “very high” and “high” PFYC, and as needed in areas with “moderate” PFYC. Require monitoring of surface-disturbing activities based on inventory results.

5000 HERITAGE RESOURCES (HR) – PALEONTOLOGICAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
5028	HR: 14.1, 15.2, 16.2, 16.3	Beaver Rim proposed NNL (1,120 acres within the Beaver Rim ACEC): Continue current management of the Beaver Rim ACEC (see Special Designations – ACECs for current management of the Beaver Rim ACEC), which will protect the NNL's fossil resources. Mineral and realty actions in the Beaver Rim proposed NNL are managed with Category 3 restrictions and a Plan of Operations is required for locatable mineral activities.	Mineral and realty actions in the Beaver Rim proposed NNL are managed with Category 5 restrictions. In addition, apply the following restrictions and management within the Beaver Rim fossil area: <ul style="list-style-type: none"> • Complete paleontological inventory of the area to define significant fossil localities. • Develop a management plan to preserve and protect significant paleontological resources. • Limit motorized travel to existing roads and trails. • Do not authorize any use that NEPA analysis determines to cause a significant adverse impact to a fossil area. • Close significant fossil localities to land disposals. 	Manage paleontological resources on a case-by-case basis.	Same as Alternative A.
5029	HR: 14.1	Mineral and realty actions in the Bison Basin proposed NNL (1,280 acres) are managed with Category 2 restrictions.	Mineral and realty actions in the Bison Basin NNL are managed with Category 5 restrictions. In addition, apply the following restrictions and management within the Bison Basin fossil area: <ul style="list-style-type: none"> • Complete a paleontological inventory of the area to define significant fossil localities. • Develop a management plan to preserve and protect significant paleontological resources. • Limit motorized travel to existing roads and trails. • Do not authorize any use that NEPA analysis determines to 	Manage paleontological resources on a case-by-case basis.	Same as Alternative A.

5000 HERITAGE RESOURCES (HR) – PALEONTOLOGICAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			cause a significant adverse impact to a fossil area. • Close significant fossil localities to land disposals.		
5030	HR: 15.1, 16.3	In the Bonneville to Lost Cabin high potential fossil area, continue inventory and monitoring of surface-disturbing activities in areas with “very high” and “high” PFYC to manage fossil resources.	Same as Alternative A, plus complete a paleontological reconnaissance of the area and develop a management plan to protect significant paleontological resources.	Same as Alternative A.	Same as Alternative A.
5031	HR: 15.1, 16.3	In the Lander Slope high potential fossil area, continue inventory and monitoring of surface-disturbing activities in areas with “very high” and “high” PFYC to manage fossil resources.	Same as Alternative A, plus complete a paleontological reconnaissance of the area and develop a management plan to preserve and protect significant paleontological resources.	Same as Alternative A.	Same as Alternative A.
5032	HR: 15.1, 16.3	In the Gas Hills high potential fossil area, continue inventory and monitoring of surface-disturbing activities in areas with “very high” and “high” PFYC to manage fossil resources.	Same as Alternative A, plus complete a paleontological reconnaissance of the area and develop a management plan to preserve and protect significant paleontological resources.	Same as Alternative A.	Same as Alternative B.

Table 2.26. 5000 Heritage Resources (HR) – Visual Resources

5000 HERITAGE RESOURCES (HR) – VISUAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal HR: 17 Maintain the overall scenic (visual) quality of BLM-administered lands.					
Objectives:					
HR: 17.1 VRM Class I Objective: Preserve the existing character of the landscape. Provide for natural ecological changes; however, preserving the landscape will not preclude very limited management activity. The level of change to the characteristic landscape will be very low and will not attract attention.					
HR: 17.2 VRM Class II Objective: Retain the existing character of the landscape. The level of change to the characteristic landscape will be low. Management activities may be seen but will not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.					
HR: 17.3 VRM Class III Objective: Partially retain the existing character of the landscape. The level of change to the characteristic landscape will be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes will repeat the basic elements found in the predominant natural features of the characteristic landscape.					
HR: 17.4 VRM Class IV Objective: Provide for management activities which require major modification to the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt will be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements found in the predominant natural features of the characteristic landscape.					
Note: Management actions associated with Scenic ACECs, NHTs, and Scenic Trails are contained within the Special Designations section.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
5033	HR: 17.1	Manage WSAs as VRM Class I visual resources (Map 128).			
5034	HR: 17.1, 17.2	Prohibit surface-disturbing activities within important scenic areas (VRM Class I and II visual resources). Grant exceptions if it can be demonstrated through a visual simulation and contrast rating worksheet (from all key observation points within the area) that the project or identified mitigation will meet or exceed VRM Class I or II objectives. This restriction does not apply to temporary structures such as drilling rigs.			
5035	HR: 17.1, 17.2	Work with private landowners and partners to pursue conservation easements on lands adjacent to areas managed as VRM Class I and II visual resources.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

5000 HERITAGE RESOURCES (HR) – VISUAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
5036	HR: 17.1, 17.2, 17.3, 17.4	<p>Maintain existing VRM Class designations for BLM-administered surface lands in the planning area (Map 75):</p> <ul style="list-style-type: none"> VRM Class I: 57,443 acres VRM Class II: 202,785 acres VRM Class III: 222,121 acres VRM Class IV: 1,853,862 acres VRM Class V*: 57,995 acres <p>*VRM Class V no longer exists as a Class objective option for managing visual resources. As a result, these areas are managed as VRM Class IV.</p>	<p>Allow fewer visual intrusions on BLM-administered surface lands in the planning area by reducing the amount of VRM Class IV visual resource inventory areas to existing oil and gas fields and around large open pit mines (Map 76).</p> <p>This would result in the following approximate land use allocations:</p> <ul style="list-style-type: none"> VRM Class I: 59,317 acres VRM Class II: 1,284,122 acres VRM Class III: 292,890 acres VRM Class IV: 756,813 acres 	<p>Allow for more visual intrusions on BLM-administered surface lands except in areas managed as VRM Class I visual resources (Map 77).</p> <p>This would result in the following approximate land use allocations:</p> <ul style="list-style-type: none"> VRM Class I: 55,360 acres VRM Class II: 25,730 acres VRM Class III: 722,356 acres VRM Class IV: 1,590,758 acres 	<p>Adjust the new Lander Field Office VRM designations to allow for resource development while also protecting important scenic features:</p> <ul style="list-style-type: none"> VRM Class I: 60,115 acres VRM Class II: 780,810 acres VRM Class III: 857,979 acres VRM Class IV: 694,759 acres
5037	HR: 17.1, 17.2	No similar action.	On a case-by-case basis in areas managed as VRM Class III and IV, prohibit surface-disturbing and disruptive activities that create a moderate to strong contrast with the existing visual environment that can be observed from areas managed as VRM Class I and II, such as wind development.	Allow surface-disturbing activities in areas managed as VRM Class III and IV visual resources that can be observed from areas managed as VRM Class I and II, regardless of the degree of visual contrast.	<p>Surface-disturbing activities within VRM Class III and IV not within view of Congressionally Designated Trails will be evaluated based on the VRM Class designation at the site of the surface disturbance.</p> <p>Surface-disturbing activities out of scale with the surrounding landscape within view of the Congressionally Designated Trails will be evaluated based on VRM Class II standards.</p> <p>To protect visual resource values, areas south of the Green Mountain ACEC are closed to wind-energy development (Map 100).</p>
5038	HR: 17.1, 17.2, 17.3	All proposed actions within areas managed as VRM Class I, II, and	Same as Alternative A, plus all proposed actions within areas managed as VRM Class I and II visual resources require a visual	Same as Alternative A, except on a case-by-case basis determine if the project applicant would be required to utilize a visual	Same as Alternative C.

5000 HERITAGE RESOURCES (HR) – VISUAL RESOURCES					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		III visual resources require a VRM contrast rating worksheet.	simulation prior to analysis and/or mitigation design (Map 76).	simulation to test or show mitigation measures.	

Table 2.27. 6000 Land Resources (LR) – Lands and Realty

6000 LAND RESOURCES (LR) – LANDS AND REALTY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal LR: 1 Manage the acquisition, disposal, withdrawal, and use of BLM-administered lands to meet the needs of internal and external customers and to preserve important resource values.					
Objectives:					
LR: 1.1 Develop and maintain a land-ownership pattern that will provide access for managing and protecting BLM-administered lands.					
LR: 1.2 Use appropriate actions such as disposal and acquisition to resolve issues related to intermixed land-ownership patterns.					
LR: 1.3 Maintain availability of BLM-administered lands to meet the habitation, cultivation, trade, mineral development, recreation, and manufacturing needs of external customers and the general public. Improve access to BLM-administered lands.					
LR: 1.4 Withdraw BLM-administered lands to meet resource protection needs.					
LR: 1.5 Identify areas for R&PP actions.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
6001	LR: 1.1, 1.2	Respond to specific proposals for land use authorizations on a case-by-case basis. Do not classify, open, or make available any BLM-administered lands for agricultural leasing or agricultural entry under either the Desert Land Entry or Indian Allotment for one or more of the following reasons: unsuitable topography, presence of sensitive resources or resource conflicts, lack of water or access, small parcel size, or unsuitable soils.			
6002	LR: 1.2	Identify lands for acquisition through exchange and/or purchase (Map 1) with priority on meeting special management objectives such as greater sage-grouse Core Area, ACECs, and NLCS lands. Prioritize lands that do not have split estate unless in Core Area where greater sage-grouse management objectives would benefit.			
6003	LR: 1.3	The BLM currently leases 35 acres under the R&PP Act. The Recreation section has alternatives for two new R&PP leases. Consider R&PP leases and patents through the planning area as requested by qualified entities.			
6004	LR: 1.2	Lands identified for disposal or disposal with restrictions will be classified under Sections 203, 206, and 209 of FLPMA.			
6005	LR: 1.1	No parcels within an NLCS unit or an ACEC or in greater sage-grouse Core Area are identified for disposal unless the disposal would benefit the goals and objectives of the area’s priority values or other important resource values. (In the 1987 RMP, parcels in NLCS units were identified for disposal but Alternative A management is to retain all parcels in these areas.) Acquire lands in areas with mixed ownership and where land exchanges would result in additional or more contiguous federal ownership patterns or would improve management for the benefit of priority resources.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
RETENTION OF BLM-ADMINISTERED LANDS					
6006	LR: 1.1, 1.2	Retain approximately 2,385,637 acres of BLM-administered land.	Retain approximately 2,388,774 acres of BLM-administered land.	Same as Alternative B.	Retain approximately 2,386,137 acres of BLM-administered land.

6000 LAND RESOURCES (LR) – LANDS AND REALTY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
DISPOSAL OF BLM-ADMINISTERED LANDS					
6007	LR: 1.1, 1.2	8,573 acres of BLM-administered land are available for disposal by sale, exchange, or other means (Map 94).	5,436 acres of BLM-administered land are available for disposal by sale, exchange, or other means (Map 95).	Same as Alternative B.	8,073 acres of BLM-administered land are available for disposal by sale, exchange, or other means (Map 94).
6008	LR: 1.1, 1.2	1,475 acres of BLM-administered land are available for disposal with restrictions on use (Map 94).	1,435 acres of BLM-administered land are available for disposal with restrictions on use (Map 95), including offsite compensation or mitigation, including the establishment of a conservation easement.	Same as Alternative B.	6,665 acres of BLM-administered land are available for disposal with restrictions on use (Map 94), including offsite compensation or mitigation, including the establishment of a conservation easement.
BLM WITHDRAWALS					
6009	LR: 1.4	23,114 acres are identified for withdrawal (Map 21). 8,634 acres are withdrawn in pre-FLPMA actions.	Pursue withdrawals on a total of 1,632,605 acres in the planning area (Map 22) including the acres identified in Alternative B. Renew existing withdrawals before expiration. 8,634 acres are withdrawn in pre-FLPMA actions.	Do not pursue new withdrawals. Existing withdrawals other than the desert yellowhead withdrawal, are allowed to expire. 8,634 acres are withdrawn in pre-FLPMA actions.	Pursue withdrawals on 449,068 acres (Map 24). Renew existing withdrawals before they expire. 8,634 acres are withdrawn in pre-FLPMA actions.

Table 2.28. 6000 Land Resources (LR) – Renewable Energy

6000 LAND RESOURCES (LR) – RENEWABLE ENERGY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal LR: 2 Provide opportunities for developing alternative energy resources.					
Objective:					
LR: 2.1 Identify areas suitable for locating alternative energy developments where important cultural and natural resource values will not be adversely affected by these facilities.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
6010	LR: 2	Management prescriptions for wind-energy development in important wildlife habitat, areas managed as VRM Class I and II, RMZs, areas with cultural resources, and special designations are found in those respective sections.			
6011	LR: 2	Consider non-wind renewable energy development on a case-by-case basis consistent with management and objectives identified in the RMP. Approval of non-wind renewable energy development inconsistent with management and objectives in the RMP would require a Land Use Plan amendment.			
6012	LR: 2	Programmatic policies and Best Management Practices for wind-energy development are identified in the ROD for Wind-Energy Development on Bureau of Land Management-Administered Land in the Western States (2006) and IM 2009-043. The ROD identified the following areas within the NLCS as wind-energy development exclusion areas: <ul style="list-style-type: none">• WSAs (55,338 acres) (Map 128)• CDNST (no buffer is identified) (Map 121)• NHTs (no buffer is identified) (Map 123)• NWSRS-eligible waterway segments (9,919 acres of BLM-administered surface) (Map 129)			
6013	LR: 2	Initiate government-to-government consultation with the appropriate tribal governments if it is determined that wind-energy development proposals might directly and substantially affect tribes.			
6014	LR: 2	Programmatic policies, Best Management Practices, leasing procedures, and stipulations identified in the ROD for the PEIS for Geothermal Leasing in the Western United States (2008) are analyzed in the minerals section.			
MANAGEMENT ACTION BY ALTERNATIVE					
6015	LR: 2	Manage 2,113,512 acres as open to wind-energy development (Map 97). Manage 64,816 acres as wind-energy development avoidance areas (Map 97). Manage 215,882 acres as wind-energy development exclusion areas (Map 97).	Manage 41,372 acres as open to wind-energy development (Map 98). Manage 23,887 acres as wind-energy development avoidance areas (Map 98). Manage 2,328,951 acres as wind-energy development exclusion areas (Map 98).	Manage 2,284,235 acres as open to wind-energy development (Map 99). Manage 15,818 acres as wind-energy development avoidance areas (Map 99). Manage 94,157 acres as wind-energy development exclusion areas (Map 99).	Manage 224,289 acres as open to wind-energy development (Map 100). Manage 1,215,599 acres as wind-energy development avoidance areas (Map 100). Manage 954,322 acres as wind-energy development exclusion areas (Map 100).

Table 2.29. 6000 Land Resources (LR) – Rights-of-Way and Corridors

6000 LAND RESOURCES (LR) – RIGHTS-OF-WAY AND CORRIDORS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal LR: 3 Manage BLM-administered lands to meet transportation and ROW needs.					
Objectives:					
LR: 3.1 Provide opportunities to meet the needs of ROW customers.					
LR: 3.2 Support the availability of ROWs consistent with federal policies regarding the development of renewable energy sources.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
6016	LR: 3.1, 3.2	In accordance with the ROD for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States (2009), Energy Corridor 79-216 is a designated corridor.			
6017	LR: 3.1	The preferred location for new ROWs and access route authorizations is in areas already disturbed by existing ROWs. See Appendix H (p. 1521) for design constraints to limit surface disturbance associated with new ROWs. Locate linear ROWs such as fiber optic and low-voltage powerline corridors along currently established road systems (e.g., state highways and county roads). Identify opportunities to reclaim duplicative ROWs or those no longer in use. Utilize IM 2012-019 Attachment 5 or later guidance to calculate disturbance associated with ROWs.			
6018	LR: 3.1	Allow carbon dioxide sequestration and research. Lands that are available to oil and gas leasing are available to carbon dioxide sequestration and research subject to the same surface limitations as would be applied to oil and gas operations. Lands that are closed to oil and gas leasing are excluded for carbon dioxide sequestration and research.			
6019	LR: 3	Close the Beef Gap section of the Sweetwater Rocks complex to any new ROWs even if co-located with existing ROWs.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
6020	LR: 3.1	On a case-by-case basis concentrate major utility ROWs in existing utility corridors whenever possible (Map 105).	Allow proposed major utility ROWs only in designated utility corridors. Designate the following routes as utility corridors and access routes and prefer these locations for the placement of utility ROWs (Map 106): <ul style="list-style-type: none">• The Lost Creek Corridor, which runs north/south from Wamsutter to Lysite (approximately ¼ mile wide, except near the NHTs, where it is 400 feet wide).	Evaluate proposed major utility ROWs on a case-by-case basis. Allow major utility corridors up to 3 miles wide in the planning area in the following locations (Map 107): <ul style="list-style-type: none">• Lost Creek Spur• Lost Creek• Pathfinder• Sand Draw to Casper• Highway 20\26• Beaver Creek North• Shoshoni\Badwater• Bairoil	The following corridors are designated as corridors for major ROW development (Map 108). Please note: the location of the designated corridors as represented on the map are approximate and subject to verification based on existing disturbance, particularly in the Sand Draw to Casper corridor through the Gas Hills mining district. The corridor widths shown on Map 108 are overstated to improve clarity. <ul style="list-style-type: none">• Jim Bridger (containing the Spence-Mustang-Jim Bridger

6000 LAND RESOURCES (LR) – RIGHTS-OF-WAY AND CORRIDORS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<ul style="list-style-type: none"> • Sand Draw to Casper-approximately 10 miles of corridor connecting Lost Creek and the Casper Field Office's designated corridor. 	<ul style="list-style-type: none"> • Boysen Scenic Byway • Lost Cabin\Pony Express • Colorado Interstate Gas • Pacificorp Transmission • Sand Draw • Bison Basin • Frontier • Frontier-Anadarko • Pacificorp 	<p>existing 230 kV powerline) from where it enters the Lander planning area in Township 25 North, Range 94 West to where it intersects with the Lost Creek pipeline: above and below ground.</p> <ul style="list-style-type: none"> • Lost Creek: variously below ground only and above and below ground as follows: <ul style="list-style-type: none"> ○ Lost Creek 1: from where the pipeline enters the Lander planning area in the south in Township 25 North, Range 93 West to where the pipeline meets the existing 230 kV powerline in the Jim Bridger corridor: below ground only. ○ Lost Creek 2: from the Jim Bridger meeting point northward until the Lost Creek pipeline meets the Sand Draw to Casper designated corridor: above and below ground. ○ Lost Creek 3: from the Sand Draw to Casper meeting point north to Highway 20/26: below ground only. ○ Lost Creek 4: from north of Highway 20/26 to the Westwide Corridor: above and below ground.

6000 LAND RESOURCES (LR) – RIGHTS-OF-WAY AND CORRIDORS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<p>The section of the corridor through the Jeffrey City area that is not within the NTMC is open to oil and gas leasing subject to CSU stipulations.</p> <ul style="list-style-type: none"> • Pathfinder: below ground only. (The Pathfinder corridor is only in the Lander planning area in Township 30 North, Range 85 West.) • Sand Draw to Casper: above and below ground • Highway 20/26: above and below ground • Beaver Creek (formerly called Beaver Creek North and Lost Creek Spur): below ground only • Shoshoni/Badwater: below ground • Bairoil: below ground only • Sand Draw: below ground only • Bison Basin: below ground only • Frontier going southwest from Bairoil to where it leaves the Lander planning area: below ground only • Frontier-Anadarko (now called Rattlesnake Hills) north of Black Rock: below ground • Pacificorp (now called Black Rock): above and below ground

6000 LAND RESOURCES (LR) – RIGHTS-OF-WAY AND CORRIDORS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<ul style="list-style-type: none"> Pacificorp (going east-west in Township 35): above and below ground <p>Widths for these corridors are ½ mile unless there are resource conflicts, then the width will be adjusted accordingly (i.e., neck down as necessary). Designated corridors are subject to the prescriptions for resource protections except that they are open for ROWs even if the surrounding areas are excluded or avoided.</p> <p>Major ROWs will not be authorized outside of designated corridors unless the proponent establishes that location in a designated corridor is not possible. Additional expense does not, by itself, render the location within a designated corridor “not possible.”</p>
6021	PR: 3.3 BR: 1.1, 11.1, 11.2	See Record 6017.	See Record 6017.	See Record 6017.	ROWs outside of designated corridors are co-located in existing disturbance unless the proponent establishes that co-location is not possible or that the new location minimizes adverse impacts to other resources compared to co-location.

6000 LAND RESOURCES (LR) – RIGHTS-OF-WAY AND CORRIDORS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6022	LR: 3.1	Authorize communication facilities under site-specific leases on a case-by-case basis. The areas avoided for utility corridors are also avoided by communication sites. Encourage co-location with existing sites. The site on Whiskey Peak is limited to facilities that will be contained within the existing building footprint.	<p>Require new communication facilities to be co-located with the following existing sites (Map 106):</p> <ul style="list-style-type: none"> • Atlantic City • Black Rock • Cedar Rim • Crooks Mountain • Gun Barrel • Horse Heaven • Muskrat <p>The site on Whiskey Peak is limited to facilities that will be contained within the existing building footprint.</p> <p>Communication facility leases will be for a maximum of 10 years.</p> <p>Review applications for renewal of existing leases to determine if improvement in technology makes the site unnecessary.</p>	Authorize communication facilities under site-specific leases on a case-by-case basis.	<p>Require new communication facilities be co-located with the following existing sites unless proponent demonstrates existing sites are unable to meet the public needs and project is consistent with the Land Use Plan (Map 108):</p> <ul style="list-style-type: none"> • Atlantic City • Cedar Rim • Crooks Mountain • Gun Barrel • Horse Heaven • Muskrat <p>The site on Whiskey Peak is limited to facilities that will be contained within the existing building footprint.</p> <p>The following sites are closed to new communication facilities and existing facilities are allowed to expire at the end of the existing ROW grant (Map 108):</p> <ul style="list-style-type: none"> • BLM Ridge • Black Rock
6023	LR: 3	Manage 66,099 acres as ROW avoidance areas (Map 101).	Manage 315,219 acres as ROW avoidance areas (Map 102).	Manage 11,714 acres as ROW avoidance areas (Map 103).	Manage 1,369,300 acres as ROW avoidance areas (Map 104). See Appendix E (p. 1483) for avoidance criteria.
6024	LR: 3	Manage 205,916 acres as ROW exclusion areas (Map 101).	Manage 1,919,029 acres as ROW exclusion areas (Map 102).	Manage 147,053 acres as ROW exclusion areas (Map 103).	Manage 417,426 acres as ROW exclusion areas (Map 104).

Table 2.30. 6000 Land Resources (LR) – Comprehensive Trails and Travel Management

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
	<p>Goal LR: 4 Utilize a comprehensive approach to travel planning and management to sustain and enhance recreational opportunities and experiences, visitor access/safety, and resource conservation and use.</p> <p>Objective:</p> <p>LR: 4.1 In consideration of the various resources, resource uses, and special designations, all BLM-administered lands within the Lander Field Office will be classified as open, limited, or closed to motorized travel.</p> <p>Goal LR: 5 Manage the use of OHVs (see Glossary) in partnership with other land-management agencies, local governments, communities, and interest groups.</p> <p>Objective:</p> <p>LR: 5.1 Pursue the opportunities (such as supplemental funding and labor contributions) to aid the BLM in implementing transportation and travel management planning decisions.</p> <p>Goal LR: 6 Utilize a travel management approach to provide and improve sustainable access for public needs and experiences.</p> <p>Objectives:</p> <p>LR: 6.1 At minimum, travel management areas will provide route networks and locations in consideration of primary travelers and valid existing rights.</p> <p>LR: 6.2 Travel management areas where access is deemed a priority will provide for sufficient route networks and locations to meet public needs.</p> <p>LR: 6.3 Travel management areas where access is deemed essential for visitor recreation experiences will provide for sufficient route networks and locations to produce targeted recreation settings.</p> <p>Goal LR: 7 Utilize a travel management approach to protect natural resources and settings.</p> <p>Objectives:</p> <p>LR: 7.1 At a minimum, travel management areas will provide route networks and locations that meet or exceed Wyoming Standards for Healthy Rangelands (see Appendix J (p. 1537)).</p> <p>LR: 7.2 Travel management areas intensively managed to protect natural and cultural resources will provide networks and locations that maintain or enhance the quality of the identified resource.</p>				

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>LR: 7.3 Travel management areas intensively managed to protect recreational, archeological, paleontological, and visual settings will provide route densities and locations that maintain or enhance the identified setting quality.</p> <p>Goal LR: 8 Utilize a travel management approach to promote the safety of public land users.</p> <p>Objective:</p> <p>LR: 8.1 Provide route networks, locations, or visitor information to promote the safety of public land users.</p> <p>Goal LR: 9 Utilize a travel management approach to minimize conflicts among the various users of BLM-administered lands.</p> <p>Objective:</p> <p>LR: 9.1 Provide route networks, route locations, or visitor information to minimize resource use/user conflict.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
6025	LR: 6.1, 6.2, 6.3, 7.1, 7.2, 7.3, 8.1, 9.1	Evaluate management decisions concerning modifications to “limited areas” and recreational facility or trail proposals through activity level planning. Evaluate Comprehensive Trails and Travel Management decisions to determine whether they are consistent with meeting specific land use plan and management objectives, prescriptions, or the Wyoming Standards for Healthy Rangelands. Adjust travel systems to ensure they remain in compliance with meeting area-specific land use plan and other management objectives, including providing access to BLM-administered lands. Maintain the existing roadless areas, within the Greer Peak and Lysite Mountain regions.			
6026	LR: 6.1, 6.2, 6.3, 7.1, 7.2, 7.3, 8.1, 9.1	Evaluate modifications (as needed to meet planning objectives) to all ‘limited’ travel designations through activity level planning.			
6027	LR: 6.1, 6.2, 6.3, 7.1, 7.2, 7.3, 8.1, 9.1	Grant administrative use authorizations on a case-by-case basis with approval from the Authorized Officer. All access agreements will specify the following: what type of use is allowed and for what purpose, times, dates or seasons of access, where the use will occur, and additional stipulations required to provide for adequate resource protection and to meet pertinent planning decisions.			
6028	LR: 7.2	Close critical habitat of the desert yellowhead (360 acres) to motorized travel to protect sensitive plant habitat (Map 67).			
6029	LR: 6.1, 6.2, 6.3, 7.1, 7.2, 7.3, 8.1, 9.1	In areas with limited travel designations, limit motorized and mechanized travel to within 300 feet from motorized/mechanized routes for direct access for big game carcass retrieval provided that: (1) no resource damage occurs, (2) no new routes are created, and (3) such access is not otherwise prohibited by the Authorized Officer.			
6030	LR: 7.2	Close the Rocky Ridge segment of the NHTs to motorized travel to protect sensitive historic resources (Map 123).			

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6031	LR: 5.1, 7.3	Pursue opportunities to develop inter-agency implementation and enforcement of travel management decisions to improve public education regarding travel and to reduce non-compliance.			
6032	LR: 4	Define an over-snow vehicle as a motorized vehicle that is designed for use over snow and runs on a track or tracks and/or a ski or skis. An over-snow vehicle does not include machinery used strictly for the grooming of nonmotorized trails.			
6033	LR: 9.1	On groomed nonmotorized winter trails (e.g., Beaver Creek Nordic Ski Area), restrict travel to only nonmotorized uses during the grooming season (December 1 to May 1) unless otherwise approved by the Authorized Officer (Map 109).			
MANAGEMENT ACTIONS BY ALTERNATIVE					
OVER-LAND TRAVEL					
6034	LR: 6.1, 7.1, 7.2, 7.3	To protect winter wildlife habitat, sensitive soils, erodible slopes, watersheds, and visual resources, limit motorized travel in the following areas to designated roads and trails subject to seasonal travel limitations (closed December 1 to June 15) (Map 109): <ul style="list-style-type: none">• Lander Slope (21,575 acres)• Red Canyon (14,730 acres)• Whiskey Mountain (7,699 acres)• Green Mountain above 7,000 feet (63,491 acres)	To protect wildlife winter/parturition habitat, sensitive soils, erodible slopes, watersheds, and visual resources, limit motorized and mechanized travel in the following areas to designated roads and trails subject to seasonal travel limitations (closed December 1 to June 15) (Map 110): <ul style="list-style-type: none">• Lander Slope (21,575 acres)• Red Canyon (14,730 acres)• Whiskey Mountain (2,728 acres)• Green Mountain (63,491 acres) Close 5,490 acres of the existing Whiskey Mountain area to motorized and mechanized travel.	Do not apply seasonal travel limitations (Map 111).	To protect wildlife winter/parturition habitat, sensitive soils, erodible slopes, watersheds, and visual resources, limit motorized and mechanized travel in the following areas to designated roads and trails subject to seasonal travel limitations (Map 112): <ul style="list-style-type: none">• Lander Slope ACEC (except the Bus @ Baldwin Creek, Sinks Canyon Climbing Area and Baldwin Creek Canyon which are discussed below) is closed to motorized vehicles December 1 to June 15 (25,065 acres).• Red Canyon is closed to all travel (human presence) from December 1 to April 30 and closed to motorized travel from December 1 to June 15 (15,109 acres) (Map 113).• Whiskey Mountain ACEC (except Whiskey Mountain WSA and lands with wilderness characteristics which are discussed below) is closed to motorized vehicles December 1 to May 1).

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<ul style="list-style-type: none"> Green Mountain is closed to motorized vehicle use December 1 to June 15 at identified points on roads and trails rather than based on elevation.
6035	LR: 6.1, 7.1, 7.2, 7.3	To protect winter wildlife habitat and watersheds, limit motorized travel in the following area to existing roads (Map 109) without seasonal restrictions: <ul style="list-style-type: none"> East Fork (4,431 acres) Beaver Rim ACEC (6,421 acres) 	To protect winter wildlife habitat and watersheds, limit motorized and mechanized travel in the following areas to designated roads and trails (Map 110): <ul style="list-style-type: none"> East Fork (14,802 acres) subject to seasonal travel limitations (closed December 1 to June 15) Beaver Rim Area (20,254 acres) Cedar Ridge (7,039 acres) 	Same as Alternative A.	To protect winter wildlife habitat and watersheds, limit motorized and mechanized travel in the East Fork ACEC to designated roads and trails (Map 112). The East Fork ACEC is seasonally closed to all travel December 16 to May 15 (consistent with surrounding WGFD lands) except for those BLM-administered lands directly accessed from East Fork County Road.
6036	LR: 6.1, 7.1, 7.2, 7.3	Limit motorized travel in the Beaver Rim ACEC (6,421 acres) to existing roads and trails (Map 109).	Limit motorized and mechanized travel in the Beaver Rim Area (20,254 acres) to designated roads and trails (Map 110).	Same as Alternative A.	Same as Alternative A, until a Travel Management Plan is completed, at which time motorized travel will be limited to designated routes.
6037	LR: 6.1, 7.1, 7.2, 7.3	Close the Dubois Badlands ACEC (4,897 acres) to motorized travel to protect natural resources, recreational values, the WSA, and scenic resources (Map 109).	Same as Alternative A.	Limit motorized travel in the WSA portion of the Dubois Badlands ACEC to designated roads and trails that existed and were identified before or during the inventory phase of the wilderness review. Limit motorized travel in the area within the ACEC, but outside of the WSA to existing roads and trails (Map 111).	The WSA portion of the area is closed to motorized vehicles. Management of the non-WSA lands is discussed in the ACEC - East Fork section.

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6038	LR: 6.1, 7.1, 7.2, 7.3	The Castle Gardens TCP area (78 acres) is closed to motorized travel to protect natural and cultural resources (Map 109) except for one designated road to the parking area. Travel management in the area outside of the TCP identified in Alternative B as part of the ACEC area is limited to existing roads and trails.	Same as Alternative A, except that travel in the part of the proposed ACEC outside of the TCP is limited to designated roads and trails.	Limit motorized travel within the Castle Gardens area (78 acres) and the adjacent areas to existing roads and trails (Map 111).	Limit motorized travel within the immediate Castle Gardens area and the periphery (1734 acres) to designated roads and trails (Map 112).
6039	LR: 6.1, 7.1, 7.2, 7.3	Limit motorized travel in the areas adjacent to WSAs (Map 109) to existing roads and trails up to the boundary of the WSA.	To provide logical visitor management boundaries, limit motorized and mechanized travel in the area directly adjacent to the following WSAs to designated roads and trails (Map 110): <ul style="list-style-type: none"> • Copper Mountain (6,936 acres) • Sweetwater Rocks (including the area around Split Rock, Lankin Dome, Miller Springs, and Savage Peak WSAs) (34,186 acres) • Sweetwater Canyon (9,135 acres) 	Same as Alternative A.	Same as Alternative A, until a Travel Management Plan is completed, at which time motorized travel will be limited to designated routes.
6040	LR: 6.1, 6.3, 7.1, 7.3	Open the following areas to mechanized travel (Map 109): <ul style="list-style-type: none"> • The Bus @ Baldwin Creek • The Dubois Mill Site • Johnny Behind the Rocks/Blue Ridge • Sinks Canyon Climbing Area 	To manage areas in accordance with the recreation alternatives, limit mechanized travel in the following areas to designated roads and trails (Map 110): <ul style="list-style-type: none"> • The Bus @ Baldwin Creek • The Dubois Mill Site • Johnny Behind the Rocks/Blue Ridge • Sinks Canyon Climbing Area 	Same as Alternative A.	Same as Alternative A.

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6041	LR: 6.1, 6.3, 7.1, 7.3	Limit motorized travel in the following areas to existing roads and trails (Map 109): <ul style="list-style-type: none"> Johnny Behind the Rocks/Blue Ridge Limit motorized travel in the following areas to designated roads and trails (Map 109): <ul style="list-style-type: none"> The Bus @ Baldwin Creek The Dubois Mill Site Sinks Canyon Climbing Area 	To manage RMZs in the manner detailed in the recreation alternatives, close the following areas to motorized travel (Map 110): <ul style="list-style-type: none"> The Bus @ Baldwin Creek The Dubois Mill Site Johnny Behind the Rocks/Blue Ridge Sinks Canyon Climbing Area 	Same as Alternative A.	To manage RMZs in the manner detailed in the recreation alternatives, close the following areas to motorized travel (Map 112): <ul style="list-style-type: none"> The Bus @ Baldwin Creek Johnny Behind the Rocks/Blue Ridge Sinks Canyon Climbing Area
6042	LR: 6.1, 7.1, 7.2, 7.3	Do not specially manage lands with wilderness characteristics.	In order to maintain lands with wilderness characteristics, close the following area to motorized and mechanized vehicle travel (Map 110): <p>Little Red Creek Complex (5,490 acres) including:</p> <ul style="list-style-type: none"> Glacier Trail Red Creek Torrey Rim 	Same as Alternative A.	In order to maintain lands with wilderness characteristics, close the following area to motorized travel and limit mechanized travel to designated roads and trails (Map 112): <p>Little Red Creek Complex (4,954 acres) including:</p> <ul style="list-style-type: none"> Red Creek Portions of Torrey Rim
6043	LR: 6.1, 7.1, 7.2, 7.3	In order to maintain the outstanding remarkable values of eligible WSR waterways, motorized travel in Sweetwater Canyon and Baldwin Creek Canyon is limited to designated roads and trails.	In order to maintain the outstanding remarkable values of suitable WSR waterways, close the following areas to motorized and mechanized travel (Map 110): <ul style="list-style-type: none"> Baldwin Creek Canyon (2,349 acres) Sweetwater Canyon (9,135 acres) 	Do not manage any watercourses as tentatively classified eligible and suitable WSR waterways.	Same as Alternative B for motorized and mechanized travel in Baldwin Creek Canyon. Travel management in Sweetwater Canyon is in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . See the Special Designations section for Sweetwater Canyon travel management.

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6044	LR: 6.1, 7.1, 8.1, 9.1	Limit motorized travel in the planning area, unless otherwise specified, to existing roads, primitive roads, and trails (2,226,504 acres) (Map 109) at a minimum, until such time as travel management planning is complete and routes are either designated or closed. This designation is an interim designation until route-specific planning can occur. At the point at which route planning is implemented, motorized travel in the area will be limited to designated roads and trails. For more information on this process see Appendix W (p. 1813).	Same as Alternative A, except limit motorized travel on 2,128,741 acres to existing roads, primitive roads, and trails (Map 110). This designation is an interim designation until route-specific planning can occur. At the point at which route planning is implemented, motorized travel in the area will be limited to designated roads and trails. For more information on this process see Appendix W (p. 1813).	Same as Alternative A, except limit motorized travel on 2,337,958 acres to existing roads, primitive roads, and trails (Map 111). This designation is an interim designation until route-specific planning can occur. At the point at which route planning is implemented, motorized travel in the area will be limited to designated roads and trails. For more information on this process see Appendix W (p. 1813).	Same as Alternative A, except limit motorized travel on 2,213,081 acres (Map 112). This designation is an interim designation until route-specific planning can occur. At the point at which route planning is implemented, motorized travel in the area will be limited to designated roads and trails. For more information on this process see Appendix W (p. 1813).
6045	LR: 6.1, 6.2, 6.3	Limit motorized travel in the remainder of the planning area to existing roads and trails (Map 109), except for the performance of necessary tasks requiring motorized travel (e.g., retrieving big game carcasses, repairing range improvements, managing livestock, and mineral activities where surface disturbance does not total more than 5 acres as described in the “5 acre exemption” under the 43 CFR 3809 regulations).	Prohibit cross-country motorized travel in all areas with limited and closed travel management designations (Map 110), with the following exceptions and supplementary stipulations: <ul style="list-style-type: none"> • BLM authorization to exercise valid existing rights • For emergency and other purposes as authorized under 8340.0-5(a)(2), (3), (4) and (5) • Any non-amphibious registered motorboat • Any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes • Any vehicle whose use is expressly authorized by 	Same as Alternative A.	Same as Alternative B. Authorizations or permits that include motorized vehicle activities shall address the use of motorized vehicles as part of the authorization or permit. Authorized motorized vehicle activities will require NEPA analysis and other environmental compliance actions and should be compatible with the RMP goals and objectives. Any motorized vehicle use associated with applying for an authorization or permit is subject to the regulations and policies related to the particular application process. See Management Actions Common to All Alternatives for

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			the Authorized Officer, or otherwise officially approved <ul style="list-style-type: none"> • Vehicles in official use • Any combat or combat support vehicle when used in times of national defense emergencies 		additional information regarding use authorizations.
OVER-SNOW TRAVEL					
6046	LR: 6, 7, 8, 9	Do not limit over-snow vehicle travel.	Areas open to over-snow vehicle travel must have a minimum average of 12 inches of snow or be recognized as a groomed motorized trail such as the Continental Divide Snowmobile Trail. If these conditions do not exist, then the over-land travel designations regulate travel in the area.	Same as Alternative A.	Same as Alternative B.
6047	LR: 7.1, 7.2, 7.3, 8.1, 9.1	Close the Red Canyon area (14,730 acres) to all forms of over-snow travel including motorized and nonmotorized use (Map 114).	Same as Alternative A, plus explicitly close the following areas to over-snow motorized travel (Map 115): <ul style="list-style-type: none"> • Beaver Creek Nordic Ski Area (33 acres) • East Fork (14,802 acres) • Green Mountain (63,491 acres) • Lander Slope (21,575 acres) • Whiskey Mountain (2,209 acres) Close the following WSAs to over-snow motorized travel: <ul style="list-style-type: none"> • Copper Mountain (6,936 acres) • Lankin Dome (6,347 acres) • Miller Springs (6,697 acres) • Savage Peak (7,178 acres) • Split Rock (13,963 acres) • Sweetwater Canyon (9,135 acres) 	Do not close any areas to over-snow motorized travel.	The following areas are limited (closed) seasonally to over-snow motorized travel (Map 116): <ul style="list-style-type: none"> • Lander Slope ACEC (except the Bus @ Baldwin Creek, Sinks Canyon Climbing Area and Baldwin Creek Canyon which are discussed below) closed to over the snow motorized vehicles December 1 to June 15 (21,558 acres) • Red Canyon closed to travel (human presence) from December 1 to April 30 and closed to motorized over-snow travel December 1 to June 15 (15,109 acres) • Whiskey Mountain ACEC (except Whiskey Mountain WSA and lands with wilderness characteristics

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<ul style="list-style-type: none"> Whiskey Mountain (519 acres) <p>Close the Little Red Creek Complex (5,490 acres) of lands with wilderness characteristics to over-snow vehicle travel.</p>		<p>which are discussed below) closed to motorized over-snow travel December 1 to May 15 (5,089 acres)</p> <ul style="list-style-type: none"> East Fork (except for contiguous BLM-administered lands intersected by the East Fork County Road) closed to all travel consistent with WGFD-managed lands which are currently closed December 16 to May 15 Green Mountain closed to motorized vehicles December 1 to June 15 <p>Close the following areas to over-snow motorized travel:</p> <ul style="list-style-type: none"> Beaver Creek Nordic Ski Area The Bus @ Baldwin Creek Sinks Canyon Climbing Area Baldwin Creek Canyon Little Red Creek Complex of lands with wilderness characteristics <p>Close the following WSAs to over-snow motorized travel:</p> <ul style="list-style-type: none"> Copper Mountain (6,936 acres) Lankin Dome (6,347 acres) Miller Springs (6,697 acres) Savage Peak (7,177 acres) Split Rock (13,963 acres) Sweetwater Canyon (9,135 acres)

6000 LAND RESOURCES (LR) – COMPREHENSIVE TRAILS AND TRAVEL MANAGEMENT					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					● Whiskey Mountain (519 acres)
6048	LR: 6.1, 6.2, 6.3	Open the remainder of the planning area to over-snow motorized travel (2,379,481 acres) (Map 114). Do not limit over-snow travel based on snow depth.	Open the remainder of the planning area to over-snow motorized travel subject to snow depth limits contained in Record 6046 (2,213,037 acres) (Map 115).	The planning area is open to over-snow motorized travel. Do not limit over-snow travel based on snow depth.	The remainder of the planning area is open to over-snow motorized travel subject to snow depth limits contained in Record 6046 (2,323,785 acres) (Map 116).

Table 2.31. 6000 Land Resources (LR) – Livestock Grazing Management

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal LR: 10 Maintain or enhance rangeland health and livestock grazing opportunities.					
Objectives:					
LR: 10.1 Continue to assess rangeland health on a 10-year cycle in accordance with the Wyoming Standards for Healthy Rangelands. Use rangeland health assessments to prioritize <u>rangeland</u> management.					
LR: 10.2 Implement grazing strategies, including range improvement projects, to maintain or enhance vegetative communities and ecosystem functions and to achieve the Wyoming Standards for Healthy Rangelands and grazing objectives in cooperation, consultation, and coordination with permittees/lessees, cooperators and the interested public. Design all range projects in a manner that minimizes potential for invasive species establishment. Monitor for, and treat <u>invasive species associated with existing range improvements</u>					
LR: 10.3 Manage allotment and pasture boundaries to facilitate grazing management that maintains and enhances rangeland health.					
LR: 10.4 Update and use the allotment priority ranking (Maintain, Improve, and Custodial categorization process) established in the 1987 RMP and update allotment categories with new information as it becomes available.					
LR: 10.5 Manage grazing to provide sustainable forage and establish allowable use levels in those areas authorized for livestock grazing.					
LR: 10.6 Develop a forage reserve plan to identify and manage voluntary forage reserves within the planning area.					
LR: 10.7 Identify and determine areas and/or allotments available for livestock grazing.					
LR: 10.8 Support livestock grazing AUM levels consistent with multiple use and the ability of BLM-administered lands to provide adequate habitat and forage.					
LR: 10.9 Manage grazing to assist with successful recovery, reclamation, rehabilitation and restoration of disturbed rangelands to meet the Wyoming Standards for Healthy Rangelands.					
LR: 10.10 As opportunities arise, remove or modify fences to facilitate livestock, wild horse, and wildlife movement <u>and to reduce threats to animal safety.</u>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
6049	N/A	Common Goals 3 and 5 apply to values associated with livestock grazing.			

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6050	LR: 10.1, 10.2	In cooperation, consultation, and coordination with permittees/lessees, cooperators, and stakeholders including interested parties, develop and implement appropriate livestock grazing management actions to address the Wyoming Standards for Healthy Rangelands, improve forage for livestock, and enhance rangeland health. Within greater sage-grouse Core Area, incorporate greater sage-grouse habitat objectives and management considerations into all BLM grazing allotments containing greater sage-grouse habitat through AMPs or permit renewals. Consider the application of BMPs for the protection of greater sage-grouse as terms and conditions of grazing permit/lease renewals. In areas where Wyoming Standards for Healthy Rangelands are not being met or are not making progress towards meeting standards, because of current livestock grazing, modify existing permits or condition the issuance of new permits on the implementation of new grazing strategies to meet standards in accordance with grazing regulations. Apply appropriate BMPs (Appendix H (p. 1521)) as terms and conditions of the permit.			
6051	LR: 10.4	Categorize allotments as M, I, and C (see Appendix K (p. 1547)) and re-categorize as necessary. Re-categorizations from the 1987 RMP are identified in Appendix K (p. 1547).			
6052	LR: 10.2, 10.3, 10.5	A total of 69,276 acres, of which 38,058 acres cannot be made suitable for grazing and includes previously retired allotments, are unavailable for grazing (Maps 117-119).			
6053	LR: 10.7	Retain designated stock driveways. Permit other livestock trails on a case-by-case basis.			
6054	LR: 10.1	Monitor precipitation and vegetative production trends on BLM-administered lands as a tool to understand impacts to soil, water, and vegetative resources. Monitor measurable objectives and evaluate grazing management to assume that management actions are achieving greater sage-grouse habitat objectives.			
6055	LR: 10.1	On a case-by-case basis adjust allotment and pasture boundaries, including combining allotments, to facilitate management and to achieve progress towards rangeland health. Review livestock conversions on a case-by-case basis.			
6056	LR 10.8	Require that forage supplements have label information stating that the material is safe/compatible for sheep, wildlife, and wild horses in areas where conflicts exist. Require that all forage supplement labels be submitted to the field office for approval by the Authorized Officer prior to use.			
6057	LR: 10.3	Conduct grazing program monitoring (see Glossary) of allotments by focusing on Category I allotments in order of priority starting with those allotments that have degraded riparian-wetland areas or are in whole or in part in greater sage-grouse Core Area. The level of monitoring will be commensurate with the intensity of grazing. Modify BLM-authorized grazing use on an allotment-by-allotment basis to protect soil, water, vegetative resources, and wildlife.			
6058	LR: 10.9	Modify or implement livestock grazing strategies (Appendix K (p. 1547)) to facilitate successful reclamation efforts.			
6059	LR: 10.3, 10.5	Continue implementation of existing AMPs. Develop and implement new comprehensive grazing strategies and AMPs with grazing permittees/lessees and interested publics to achieve desired resource goals. Grant administrative use authorizations on a case-by-case basis with approval from the Authorized Officer. All access agreements will specify the following: what type of use is allowed and for what purpose, times, dates or seasons of access, where the use will occur, and additional stipulations required to provide for adequate resource protection and to meet pertinent planning decisions.			
6060	LR: 10	Changes in the current amounts, kinds, and season of livestock grazing use will be based on a rangeland health assessment or if resource monitoring indicates that a grazing use adjustment is necessary or an analysis indicates that a requested change in grazing use is appropriate.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6061	LR: 10.7, 10.8	The planning area is open to livestock grazing except for parcels identified on Map 117. 2,324,934 acres are open to grazing. 69,276 acres are unavailable to livestock grazing.	The planning area is open to livestock grazing except for parcels identified on Map 118. 2,312,095 acres are open to grazing. 69,276 acres are unavailable to livestock grazing.	Same as Alternative A.	The planning area is open to livestock grazing except for parcels identified on Map 119. 2,317,368 acres are open to grazing. 69,276 acres are unavailable to grazing.
6062	LR: 10.3, 10.5, 10.6	Acquired lands are open to livestock grazing on a case-by-case basis consistent with the management objectives for the acquisition or the area in which the land is located, such as an ACEC.	Acquired lands are closed to livestock grazing.	Acquired lands are open to livestock grazing.	Same as Alternative A.
6063	LR: 10.3, 10.5, 10.6	No similar action.	Where livestock grazing permits are voluntarily relinquished, the BLM will close the area to livestock grazing.	Re-offer relinquished livestock grazing permits; do not close the area to livestock grazing.	When livestock grazing permits and/or grazing preference are voluntarily relinquished in portions of or all of an allotment, analyze appropriate livestock grazing management including considering closure to livestock grazing based on benefits to resources and other uses.
6064	LR: 10.5, 10.6	No similar action.	Establish and manage future forage reserves as opportunities arise within the planning area on a voluntary basis or as lands are acquired.	Do not establish forage reserves.	Same as Alternative B.

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6065	LR: 10.7	No similar action.	Permit extended periods of non-use of grazing preference, without penalty, on a case-by-case basis when the advantage to greater sage-grouse habitat or other resource values warrant, and a permittee or lessee voluntarily takes non-use of their grazing preference in a specific grazing allotment.	No similar action.	Same as Alternative B.
6066	LR: 10.2, 10.5, 10.8	Allow new range improvements on a case-by-case basis.	Utilize non-infrastructure livestock grazing management to maintain, enhance, or achieve rangeland health. Prohibit new range improvements if adverse impacts to other resources would result.	Utilize all livestock grazing management including infrastructure and non-infrastructure to maintain, enhance, or achieve rangeland health.	Utilizing Required Design Features and BMPs such as those in Appendix H (p. 1521) applied as COA, develop and install range improvement projects necessary to implement comprehensive grazing strategies leading to improved rangeland health or to enhance successful comprehensive grazing strategies (see Glossary) already in place. Benefits associated with the projected improvement in rangeland health should exceed the adverse impacts associated with the project infrastructure. Avoid projects that would expand grazing on the landscape without a clear link to a Comprehensive Grazing Strategy and consideration of other resources.

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6067	LR: 10.10	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	<p>Include terms and conditions on grazing permits and leases that ensure plant growth requirements are met, and residual forage remains available for greater sage-grouse hiding cover as necessary. Specify as necessary:</p> <ul style="list-style-type: none"> • No new range improvement projects within ½ mile of water and riparian-wetland areas, regional historic trails, and early highways (or as needed to protect the setting, so long as impacts are not visible). • Intensity of use (utilization) subject to the provisions of Records 4018, 6050, and 6068; • Develop project-specific BMPs that become terms and conditions.
6068	LR: 10.5, 10.8	Unless otherwise specified, establish allotment stocking rates to maximize utilization of forage in areas preferred by livestock, while achieving standards for rangeland health. This action generally corresponds with a moderate (41 to 60 percent) utilization level.	Establish allotment stocking rates in areas preferred by livestock to achieve an adequate residual forage standard used as cover for wildlife and to be made available for utilization by wildlife and wild horses. This action generally corresponds with a light (21 to 40 percent) utilization level.	Same as Alternative A.	Establish stocking rates in areas preferred by livestock that allow for appropriate utilization levels by livestock adjusted for the anticipated intensity of use necessary to provide sufficient forage and cover to support and maintain healthy diverse wildlife and wild horse populations, and to achieve Wyoming Standards for Healthy Rangelands. Utilization levels may vary based on the implementation of a Comprehensive Grazing Strategy or as needed to achieve vegetation objectives.

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6069	LR: 10.9, 10.10	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	<p>Prioritize completion of land health assessments and processing of grazing permits within greater sage-grouse Core Area and on allotments with riparian-wetland areas in failing condition. Emphasize allotments that have the best opportunities for riparian-wetland improvement or for conserving, enhancing, or restoring habitat for greater sage-grouse.</p> <p>When conducting land health assessments, include indicators and measurements of structure, condition, and composition of vegetation specific to achieving greater sage-grouse habitat objectives. If local/state seasonal habitat objectives are not available, use greater sage-grouse habitat recommendations from Connelly et al. 2000 and Hagen et al. 2007 or as more recent research suggests.</p> <p>Work cooperatively with permittees, lessees, and other landowners to develop comprehensive grazing strategies to develop site-specific objectives to conserve, enhance or restore greater sage-grouse Core Area and general habitat areas. Develop a Comprehensive Grazing Strategy to achieve these objectives. In Core Area, monitor measurable objectives in representative sites</p>

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					and evaluate grazing management to ensure that management actions are achieving greater sage-grouse habitat objectives.
6070	LR: 10.2, 10.9	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	Prioritize the management of hot-season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality through the use of comprehensive grazing strategies as identified in Appendix K (p. 1547). In areas of continuous season-long grazing where rangeland health standards are not met, modify existing grazing permits to incorporate rest and/or deferment of grazing to facilitate rangeland health recovery and attainment of rangeland health standards.
6071	LR:10.8, 10.9	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	Manage drought and post-drought recovery periods for the maintenance and improvement of rangeland health, and the cover and forage needs of all grazing animals and wildlife.

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6072	LR: 10.9	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	No similar action (many of these items are addressed on a case-by-case basis).	Evaluate existing project infrastructure in the development of comprehensive grazing strategies. Identify projects that are no longer necessary, or that are contributing to adverse impacts to other resources, and modify or remove projects as appropriate to mitigate impacts, in conjunction with comprehensive grazing strategies. Evaluate whether the infrastructure contributes to the introduction or spread of INNS, and develop mitigation (including removal of infrastructure) to reduce or eliminate weed infestation and spread.
6073	LR: 10.2	Prohibit placement of salt and mineral supplements such as low moisture block supplements within ¼ mile of water and riparian-wetland areas.	Prohibit placement of salt and mineral supplements, such as low moisture block supplements: <ul style="list-style-type: none"> • closer than ½ mile to water and riparian-wetland areas and regional historic trails and early highways or as needed to protect setting • within 0.6 mile of a greater sage-grouse lek • on areas being reclaimed • within 3 miles on each side of the NHTs unless the project and its associated impacts are not visible from the NHTs 	Same as Alternative A, plus use the placement of salt and mineral supplements to maximize the utilization of the resource.	Prohibit placement of salt and mineral supplements, such as low moisture block supplements in the following areas: <ul style="list-style-type: none"> • within ½ mile of water and riparian-wetland areas, regional historic trails and early highways or as needed to protect setting, so long as impacts are not visible. • within 0.6 mile of the perimeter of greater sage-grouse leks • on areas being reclaimed Locate supplements (salt or mineral blocks) in a manner designed to conserve, enhance, or restore greater sage-grouse habitat.
6074	LR: 10.10	Remove or modify fences and cattleguards on a case-by-case basis to facilitate livestock, wild	Where opportunities exist, remove or modify existing fences and	Where opportunities exist, remove or modify fences and cattleguards	Same as Alternative A, plus remove or modify fences and cattleguards

6000 LAND RESOURCES (LR) – LIVESTOCK GRAZING MANAGEMENT					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		horses, and wildlife movement and management.	cattleguards to enhance other resource values.	as needed to facilitate livestock movement and management.	while enhancing other resource values.

Table 2.32. 6000 Land Resources (LR) – Recreation

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal LR: 11 Respond to distinct recreation customer demand by providing for customer realization of diverse activity, experience, and benefit opportunities.</p> <p>Objectives:</p> <p>LR: 11.1 Manage SRMAs for specific visitors, affected community residents, local governments and private sector businesses, or other constituents and the communities or other places where these customers originate (recreation-tourism market).</p> <p>LR: 11.2 SRMA Objective: Specific outcome-focused objectives, recreation setting character conditions, and the administrative, marketing, and monitoring framework can be found in Appendix C (p. 1453).</p> <p>Goal LR: 12 Manage to maintain or improve visitor safety, respond to use/user conflicts, and provide for resource protection.</p> <p>Objectives:</p> <p>LR: 12.1 Visitor Services Resource Protection Objective: Increase awareness, understanding, and a sense of stewardship in recreational activity participants so their conduct safeguards cultural and natural resources as defined by Wyoming Standards for Public Land Health or area-specific (such as ACEC and WSR) objectives.</p> <p>LR: 12.2 Visitor Health and Safety Objective: Ensure that visitors are not exposed to unhealthy or unsafe human-created conditions (defined by a repeat or recurring incident in the same year, of the same type, in the same location, due to the same cause).</p> <p>LR: 12.3 Use/User Conflict Objective: Achieve a minimum level of conflict between recreation participants and (1) other resource/resource uses sufficient to enable the achievement of identified land use plan goals, objectives, and actions; (2) private landowners sufficient to curb illegal trespass and property damage; and (3) other recreation participants sufficient to maintain a diversity of recreation activity participation.</p> <p>Goal LR: 13 Ensure the facilitation of Hunting Heritage and Wildlife Conservation.</p> <p>Objectives:</p> <p>LR: 13.1 Expand wildlife-dependent recreational opportunities on BLM-administered lands.</p> <p>LR: 13.2 Improve and enhance access to BLM-administered lands important for wildlife-dependent recreational opportunities.</p> <p>LR: 13.3 Ensure the enjoyment of wildlife-dependent recreation among various demographic groups.</p> <p>LR: 13.4 Facilitate trophy/high quality hunting opportunities in WGFD hunt units targeted for special management criteria.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6075	LR: 11	Continue to allow for all recreation activity types in areas allocated as an SRMA or RMZ unless otherwise specified in this land use plan or a subsequent activity level plan. In greater sage-grouse Core Area, authorize SRPs that, through mitigation or design, will have neutral or beneficial impacts to greater sage-grouse.			
6076	LR: 12.1, 12.2, 12.3	As funding allows, utilize on the ground monitoring to ensure objectives 8.1-8.3 are achieved. Through an adaptive management approach, utilize the minimum necessary remedial actions to achieve the stated objective(s).			
6077	LR: 12.1, 12.2, 12.3	Apply a 14-day campsite occupancy limit throughout the planning area.			
6078	LR: 12.1, 12.2, 12.3	Issue SRPs for commercial, competitive, or organized group activities as tools to achieve area specific planning goals, objectives, and decisions.			
6079	LR: 12	Establish new fee sites on a case-by-case basis consistent with the provisions of the REA and as necessary to support management and maintenance of developed sites and related amenities. Where appropriate to the recreational setting of all CDNST SRMAs and ERMAs, enhance the availability of dependable non-potable water sources for users.			
6080	LR: 13.2	Cooperatively pursue offsite mitigation opportunities and other partnerships to enhance wildlife-dependent recreational access to: (1) landlocked BLM-administered lands, and (2) voluntary participation of private lands with high wildlife values.			
6081	LR: 13.3	Allow any individual possessing a valid disabled hunter permit or disabled hunter companion permit from the WGFD to utilize cross-country motorized travel (in all areas except those closed to motorized travel) to retrieve big game carcasses. Additionally exempt scooters or wheelchairs utilized by valid permit holders from travel management restrictions.			
6082	LR: 13.4	Several WGFD hunt units managed under special criteria overlap with the landscapes associated with Congressionally Designated Trails and most ACECs considered in the Special Designations section. Additional management actions and allowable uses associated with WGFD hunt units managed under special criteria are therefore contained in the Special Designations section.			
6083	LR: 11.1	Additional management actions for SRMAs and ERMAs are contained in Appendix C (p. 1453).			
MANAGEMENT ACTIONS BY ALTERNATIVE					
DEVELOPED SITE MANAGEMENT					
6084	LR: 11, 12	Mineral and realty actions within the following developed recreation sites (Map 120) are managed with Category 5 restrictions: <ul style="list-style-type: none">• Castle Gardens Archeology Site (78 acres)• Atlantic City Campground (184 acres)• Big Atlantic Gulch (181 acres)• Cottonwood Campground (80 acres)	Same as Alternative A, plus mineral and realty actions within developed recreation sites and the following areas are managed with Category 6 restrictions (Map 120): <ul style="list-style-type: none">• Devils Gate Interpretive Site (112 acres)• Martins Cove Trail (927 acres)• Split Rock Rest Interpretive Site (242 acres)	The developed recreation sites identified in Alternative A are subject to Category 1 restrictions.	Same locations as alternatives A and B, but mineral and realty actions in all these areas are managed as follows (Map 120): <ul style="list-style-type: none">• Open to oil and gas leasing subject to NSO stipulations• Closed to geophysical exploration• Closed to phosphate leasing• Closed to pursue withdrawal from locatable mineral entry (to the extent the areas are not

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		<ul style="list-style-type: none"> • Lands adjacent to the Fremont County Campground (20 acres) • Miners Delight (239 acres) • Wildhorse Point (20 acres) 	<ul style="list-style-type: none"> • Steamboat Lake Overlook (128 acres) 		withdrawn under pre-FLMPA withdrawals.) <ul style="list-style-type: none"> • Closed to mineral materials disposal • Excluded to major ROWs • Excluded to minor ROWs
6085	LR: 11, 12	No similar action.	Future developed recreation sites and future national/regional trails, local system trails that connect communities, and trailheads and interpretive sites with exceptional recreational values or significant public interest are managed with Category 2 restrictions.	Relocate or remove new sites and trails in the event that leasable mineral activity cannot be sufficiently mitigated.	In the Green Mountain ERMA (129,579 acres) future and existing recreation sites, national/regional trails, local system trails, and trailheads and interpretive sites with exceptional recreational values or significant public interest are managed with Category 2 restrictions.
RECREATION AND VISITOR SERVICES OVERVIEW					
6086	LR: 11, 11.1, 13.1, 13.3	Manage the following three SRMAs for the protection of the recreation outcomes and setting prescriptions (Map 90): <ul style="list-style-type: none"> • The CDNST SRMA (111,276 acres) • The Oregon-Mormon Pioneer NHT SRMA (281,316 acres) • South Pass Historic Mining Area SRMA (13,865 acres) Note: The guidance on SRMA management has changed since the 1987 RMP. SRMA management for the above areas would resemble the management detailed for Alternative B.	Administratively recognize the following SRMAs for the protection of the recreation outcomes and setting prescriptions (Map 91) (66,363 acres) (Appendix C (p. 1453)): Lander Valley Community SRMA (6,892 acres): The SRMA includes 3 RMZs: <ol style="list-style-type: none"> 1. Sustain or enhance the Johnny Behind the Rocks RMZ (5,594 acres) for nonmotorized recreationists to engage in horseback riding, hiking, trail running, wildlife viewing, and mountain biking so that visitors report a higher than average realization 	Administratively recognize one SRMA for the protection of the recreation outcomes and setting prescriptions (Map 92) (Appendix C (p. 1453)): Dubois Mill Site Community SRMA (608 acres): Sustain or enhance the SRMA for nonmotorized and motorized recreationists to engage in hiking, walking, horseback riding, and motorized vehicle trail riding so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).	Administratively recognize the following SRMAs for the protection of the recreation outcomes and setting prescriptions (Map 93) (Appendix C (p. 1453)): Lander Valley Community SRMA (6,126 acres): The SRMA includes 3 RMZs: <ol style="list-style-type: none"> 1. Sustain or enhance the Johnny Behind the Rocks RMZ (4,828 acres) for nonmotorized recreationists to engage in horseback riding, hiking, trail running, wildlife viewing, and mountain biking so that visitors report a higher than average realization of experience and benefit

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<p>of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>2. Sustain or enhance The Bus @ Baldwin Creek RMZ (1,159 acres) for nonmotorized recreationists to engage in horseback riding, hiking, trail running, and mountain biking so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>3. Sustain or enhance the Sinks Canyon Climbing RMZ (139 acres) for muscle-powered recreationists to engage in climbing and hiking so that participants in visitor assessments/surveys report a higher than average (average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>Dubois Mill Site Community SRMA (608 acres):</p> <p>Sustain or enhance the SRMA for nonmotorized recreationists to engage in hiking, walking, horseback riding, wildlife viewing, and hunting so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p>		<p>outcomes listed in Appendix C (p. 1453).</p> <p>2. Sustain or enhance The Bus @ Baldwin Creek RMZ (1,159 acres) for nonmotorized recreationists to engage in horseback riding, hiking, trail running, and mountain biking so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>3. Sustain or enhance the Sinks Canyon Climbing RMZ (139 acres) for muscle-powered recreationists to engage in climbing and hiking so that participants in visitor assessments/surveys report a higher than average (average of 4.0 on a 5 point scale) realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>Dubois Mill Site Community SRMA (608 acres):</p> <p>Sustain or enhance the SRMA for nonmotorized recreationists to engage in hiking, walking, horseback riding, wildlife viewing, and hunting so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p>

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<p>Sweetwater Rocks Undeveloped SRMA (49,727 acres):</p> <p>Sustain or enhance the SRMA for back country enthusiasts to engage in hiking, backpacking, climbing, horseback riding, hunting, and wildlife viewing so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>Sweetwater Canyon Undeveloped SRMA (9,136 acres):</p> <p>Sustain or enhance the SRMA for back country enthusiasts to engage in hiking, backpacking, fishing, horseback riding, hunting, and wildlife viewing so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p>		<p>Sweetwater Rocks Undeveloped SRMA (41,806 acres):</p> <p>Sustain or enhance the SRMA for back country enthusiasts to engage in hiking, backpacking, climbing, horseback riding, hunting, and wildlife viewing so that visitors report a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>Sweetwater Canyon Undeveloped SRMA (9,136 acres):</p> <p>Sustain or enhance the SRMA for back country enthusiasts to engage in hiking, backpacking, fishing, horseback riding, hunting, and wildlife viewing so that visitors report a higher than average that realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p>

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6087	LR: 12.1, 12.2, 12.3, 13.1, 13.3	<p>Manage the following areas as individual ERMA's to specifically address local recreation issues (Map 90):</p> <ul style="list-style-type: none"> • Beaver Rim (2,937 acres) • Castle Gardens (78 acres) • Copper Mountain (6,936 acres) • Dubois Badlands (3,499 acres) • Government Draw (2,988 acres) • Green Mountain (53,302 acres) • Lander Slope/Red Canyon (40,175 acres) • Lysite Badlands (6,867 acres) • Sweetwater Canyon (9,135 acres) • Sweetwater Rocks (34,186 acres) • Whiskey Mountain/East Fork (3,084 acres) <p>Manage BLM-administered lands not included in separate ERMA's or SRMA's as part of the Lander ERMA.</p>	<p>Manage the following areas as individual ERMA's to specifically address local recreation issues (Map 91):</p> <ul style="list-style-type: none"> • Agate Flats (444,594 acres) • Beaver Creek Nordic Ski Area (64 acres) • Castle Gardens (78 acres) • Copper Mountain (6,936 acres) • Dubois Badlands (4,561 acres) • Coalmine Draw (2,272 acres) • Green Mountain (127,458 acres) • Lander Slope/Red Canyon (38,874 acres) • Muskrat Basin (120,120 acres) • Whiskey Mountain/East Fork (15,234 acres) <p>Manage BLM-administered lands not within ERMA's or SRMA's as part of the Lander ERMA.</p>	<p>Identify the following areas as individual ERMA's to specifically address local recreation issues:</p> <p>Same as Alternative B with the following changes (Map 92):</p> <ul style="list-style-type: none"> • Agate Flats (497,353 acres) • Sweetwater Canyon (9,137 acres) • Sweetwater Rocks (34,156 acres) • The Coalmine Draw area is not managed as an ERMA. Instead, lease the Coalmine Draw area through a R&PP Act lease. <p>Manage BLM-administrated lands not included in separate ERMA's (above) or SRMA's as part of the Lander ERMA.</p>	<p>Manage the following areas as individual ERMA's to specifically address local recreation issues (Map 93):</p> <ul style="list-style-type: none"> • Beaver Creek Nordic Ski Area (748 acres) • Green Mountain (129,579 acres) • Lander Slope/Red Canyon (38,876 acres) • Whiskey Mountain/East Fork (15,913 acres)
6088	LR: 12.1, 12.2, 12.3	Mineral and realty actions in the Beaver Creek Ski Area are managed with Category 1 restrictions.	Mineral and realty actions in the Beaver Creek Ski Area are managed with Category 2 restrictions to protect trail investments and human health and safety (Map 91).	Same as Alternative A.	Manage the Beaver Creek Ski Area as VRM Class II.
LANDER VALLEY					
JOHNNY BEHIND THE ROCKS					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6089	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Review mineral leases in the Johnny Behind the Rocks area on a case-by-case basis and apply mitigation through activity level planning. Mineral and realty actions in the area are managed with Category 1 restrictions.	Mineral and realty actions in the Johnny Behind the Rocks RMZ are managed with Category 4 restrictions.	Mineral and realty actions in the Johnny Behind the Rocks area are managed with Category 1 restrictions. Relocate or remove visitor services and facilities as necessary to accommodate leasing actions.	Mineral and realty actions in the Johnny Behind the Rocks RMZ are managed with the following restrictions: <ul style="list-style-type: none"> • Oil and gas leasing subject to NSO. • Closed to geophysical exploration. • Closed to phosphate exploration. • Closed in order to pursue withdrawal from locatable mineral entry. • Closed to mineral material sales. • Excluded from realty actions.
6090	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Limit motorized travel in the Johnny Behind the Rocks area to existing roads and trails.	Close the Johnny Behind the Rocks RMZ to motorized travel.	Same as Alternative A.	Same as Alternative B, except with an allowance for administrative access agreement with livestock grazing permittees. Do not close roads in Blue/Ridge Johnny Spring Area. Cedar ridge road will be closed as a result of this decision.
6091	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Open the Johnny Behind the Rocks area to cross-country mechanized travel.	Limit mechanized travel in the Johnny Behind the Rocks RMZ to designated routes.	Same as Alternative A.	Same as Alternative A.
6092	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Manage the Johnny Behind the Rocks area as VRM Class III and IV.	Manage the Johnny Behind the Rocks RMZ as VRM Class II.	Manage the Johnny Behind the Rocks area as VRM Class IV.	Same as Alternative B.
THE BUS @ BALDWIN CREEK AREA					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6093	LR: 11.2, 12.1, 12.2, 12.3	Mineral and realty actions in The Bus @ Baldwin Creek area are managed with Category 3 restrictions.	Mineral and realty actions in The Bus @ Baldwin Creek RMZ are managed with Category 6 restrictions.	Mineral and realty actions in The Bus @ Baldwin Creek area are managed with Category 1 restrictions. Relocate or remove visitor services and facilities as necessary to accommodate leasing actions.	Mineral and realty actions in The Bus @ Baldwin Creek RMZ is within the Lander Slope ACEC; therefore, the mineral and realty actions in this area are detailed in the Special Designations section.
6094	LR: 11.2, 12.1, 12.2, 12.3	Limit motorized travel in The Bus @ Baldwin Creek Area to designated roads and trails.	Close The Bus @ Baldwin Creek RMZ to motorized travel.	Limit motorized travel in The Bus @ Baldwin Creek area to existing roads and trails.	Same as Alternative B, plus allow livestock grazing administrative use authorization.
6095	LR: 11.2, 12.1, 12.2, 12.3	The Bus @ Baldwin Creek area is open to cross-country mechanized travel.	Limit mechanized travel in The Bus @ Baldwin Creek RMZ to designated routes.	Same as Alternative A.	Same as Alternative A.
6096	LR: 11.2, 12.1, 12.2, 12.3	Manage The Bus @ Baldwin Creek area as VRM Class III.	Manage The Bus @ Baldwin Creek RMZ as VRM Class II.	Same as Alternative A.	Same as Alternative B.
SINKS CANYON CLIMBING AREA					
6097	LR: 11.2, 12.1, 12.2, 12.3	Mineral and realty actions in the Sinks Canyon Climbing area are managed with Category 3 restrictions.	Mineral and realty actions in the Sinks Canyon Climbing RMZ are managed with Category 6 restrictions.	Mineral and realty actions in the Sinks Canyon Climbing area are managed with Category 1 restrictions.	Mineral and realty actions in the Sinks Canyon Climbing RMZ are restricted by the Lander Slope ACEC. See the Special Designations alternatives for applicable management.
6098	LR: 11.2, 12.1, 12.2, 12.3	The Sinks Canyon Climbing area is open to cross-country mechanized travel.	Limit mechanized travel in the Sinks Canyon Climbing RMZ to designated routes.	Same as Alternative A.	Same as Alternative A.
6099	LR: 11.2, 12.1, 12.2, 12.3	Limit motorized travel in the Sinks Canyon Climbing area to designated roads and trails. No designated motorized route exists within this area.	Close the Sinks Canyon Climbing RMZ to motorized travel.	Same as Alternative A.	Same as Alternative A.
6100	LR: 11.2, 12.1, 12.2, 12.3	Manage the Sinks Canyon Climbing area as VRM Class II.	Same as Alternative A.	Manage the Sinks Canyon Climbing area as VRM Class III.	Same as Alternative A.
DUBOIS MILL-SITE AREA					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6101	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Mineral and realty actions in the Dubois Mill-Site area are managed with Category 3 restrictions.	Mineral and realty actions in the Dubois Mill-Site SRMA area are managed with Category 6 restrictions.	Mineral and realty actions in the Dubois Mill-Site SRMA are managed with Category 1 restrictions.	Mineral and realty actions in the Dubois Mill-Site SRMA are managed with the following restriction: <ul style="list-style-type: none"> • Closed to oil and gas leasing • Closed to geophysical exploration • Closed to phosphate leasing • Open to locatable minerals • Closed to mineral material disposals • Excluded to major ROWs • Avoided for minor ROWs
6102	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Limit motorized travel in the Dubois Mill-Site area to designated roads and trails.	Close the Dubois Mill-Site SRMA to motorized travel.	Limit motorized travel in the Dubois Mill-Site SRMA to existing roads and trails.	Motorized travel in the Dubois Mill-Site SRMA will be limited seasonally (closed between December 1 to May 15) and to designated roads and trails.
6103	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Open the Dubois Mill-Site area to cross-country mechanized travel.	Limit mechanized travel in the Dubois Mill-Site SRMA to designated routes.	Same as Alternative A.	Mechanized travel in the Dubois Mill- Site SRMA will be limited seasonally (closed between December 1 to May 15) and to designated roads and trails.
6104	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Manage the Dubois Mill-Site area as VRM Class III.	Manage the Dubois Mill-Site SRMA as VRM Class II.	Same as Alternative A.	Same as Alternative B.
SWEETWATER CANYON					
6105	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	The Sweetwater Canyon WSA is open to livestock grazing. Note: Livestock grazing in all WSAs, including the Sweetwater Canyon WSA, is managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> .	The fenced area of the Sweetwater Canyon SRMA is closed to livestock grazing in order to enhance recreation, watershed, and wilderness values.	Same as Alternative A.	Same as Alternative A. If grazing permits in Sweetwater Canyon are voluntarily relinquished the BLM will close the area to livestock grazing.
SWEETWATER ROCKS					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6106	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	No similar action.	Work in cooperation with all partners to pursue improved nonmotorized access.	Same as Alternative B.	Same as Alternative B.
6107	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Mineral and realty actions in the area inside the WSA are managed under BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions in the area outside of the WSA (15,542 acres) are managed with Category 1 restrictions.	Mineral and realty actions in the area inside of the WSA are managed under BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions in the area outside of the WSA (15,542 acres) are managed with Category 5 restrictions.	Mineral and realty actions in the area inside of the WSA are managed under BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions in the area outside of the WSA (15,542 acres) are managed with Category 1 restrictions.	Mineral and realty actions in the area inside of the WSA are managed under BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions in the area outside of the WSA (7,622 acres) are managed in the fashion detailed under the Sweetwater Rocks special designations section.
6108	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Limit motorized travel in the area outside of the WSA to existing roads and trails.	Limit motorized travel within the SRMA in the area outside of the WSA to designated roads and trails.	Same as Alternative A.	Same as Alternative A, until a Travel Management Plan is completed, at which time motorized travel will be limited to designated routes.
6109	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Open the area outside of the WSA to cross-country mechanized travel.	Limit mechanized travel in the area of the SRMA outside of the WSA to designated routes.	Same as Alternative A.	Same as Alternative A.
6110	LR: 11.2, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	No similar action.	Work in cooperation with all partners to pursue improved nonmotorized access.	Same as Alternative B.	Same as Alternative B.
6111	LR: 11.2, 12.1, 12.2, 12.3	Manage the area outside of the WSA as VRM Class II.	Same as Alternative A.	Manage the area outside of the WSA as VRM Class III.	See management in the Sweetwater Rocks Special Designations section for VRM management in this area.
COALMINE DRAW AREA					
6112	LR: 12.1, 12.2, 12.3	Manage the Coalmine Draw area as part of the Government Draw ERMA (Map 90). Focus visitor management in this area on resource protection, ensuring human health and safety, and reducing resource use/user conflict.	Same as Alternative A.	No similar action (see below).	Same as Alternative C.

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6113	LR: 12.1, 12.2, 12.3	Do not lease the Coalmine Draw area through a R&PP action.	Same as Alternative A.	Transfer the Coalmine Draw area to a private entity through a R&PP Act action (Map 92). The purpose of this transfer will be to provide for a cross-country OHV and intensive target shooting area. Prior to the transfer being executed, establish a fenced boundary around the area to ensure impacts associated with such use do not spread on to adjacent private and public lands.	Same as Alternative A.
PUBLIC LAND EAST OF DUBOIS RIFLE RANGE ERMA					
6114	LR: 12.1, 12.2, 12.3	Manage the BLM-administered land east of the Dubois Rifle Range as part of the Lander Field Office ERMA. Focus visitor management in this area on resource protection, ensuring human health and safety, and reducing resource use and user conflict.	Same as Alternative A.	No similar action.	Same as Alternative C.
6115	LR: 12.1, 12.2, 12.3	Do not lease this land for recreation.	Same as Alternative A.	Transfer the BLM-administered lands directly east of the Dubois Rifle Range (Map 92) to a private entity through a R&PP Act action. The purpose of this transfer is to provide for a cross-country OHV area. Prior to the transfer being executed, establish a fenced boundary around the area to ensure impacts associated with such use do not spread onto adjacent private and public lands.	Same as Alternative A.
MUSKRAT BASIN ERMA					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6116	LR: 13.1, 13.3, 13.4	No similar action. Mineral and realty actions in the Muskrat Basin ERMA of Mule Deer Hunt Area 90 and Antelope Hunt Area 67 are managed with Category 1 restrictions.	Mineral and realty actions in the Muskrat Basin ERMA of Mule Deer Hunt Area 90 and Antelope Hunt Area 67 are managed with Category 2 restrictions from September 1 to November 15.	Cooperatively develop mitigation measures to reduce the impact or intensity of disruptive activities in the Muskrat Basin ERMA of Mule Deer Hunt Area 90 and Antelope Hunt Area 67. Mineral and realty actions in these areas are managed with Category 1 restrictions.	Do not designate this as an ERMA but cooperatively develop mitigation measures to reduce the impact or intensity of disruptive activities in Mule Deer Hunt Area 90 and Antelope Hunt Area 67. Mineral and realty actions in these areas are open with standard stipulations.
RED CANYON/LANDER SLOPE ERMA. See the ACEC section for additional management actions and allowable use decisions for the Lander Slope/Red Canyon ERMA.					
6117	LR: 13.1, 13.3	No similar action.	Increase back country acreage in the Weiser draw area from 2,487 acres to 4,471 acres.	Maintain existing back country acreage in the Weiser draw area (2,487 acres).	Same as Alternative C.
6118	LR: 13.1, 13.3	No similar action.	Develop and improve a primitive motorized loop route system from Highway 28 to the Limestone Mountain Road.	Same as Alternative B, except add the route to the transportation system and maintain at a standard that allows the passage of low clearance vehicles.	Same as Alternative A.
6119	LR: 13.1, 13.3	No similar action.	Minimally maintain the Shoshoni Lake Road to Paradise Creek to protect resources and ensure passage of high clearance 4x4 vehicles. The remainder of the route will be a motorized trail for OHV use where passage of normal or stock 4x4 vehicles may not be ensured.	Same as Alternative B, except enroll The Shoshoni Lake Road as a ‘trail’ in the state trails program. Maintenance will provide a challenging trail experience while ensuring safety of users and resource protection.	Same as Alternative B.
6120	LR: 12.2, 12.3	Open the Baldwin Creek Climbing trail to forest product removal.	Close the Baldwin Creek Climbing area and access trail to forest product removal.	Same as Alternative A.	Commercial timber sales and harvests in the Baldwin Creek Unit are subject to VRM Class II requirements.
AGATE FLATS ERMA					

6000 LAND RESOURCES (LR) – RECREATION					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
6121	LR: 13.1, 13.3, 13.4	Mineral and realty actions in the Agate Flats ERMA of Antelope Hunt Areas 68, 69, and 106 are managed with Category 1 restrictions.	Mineral and realty actions in the Agate Flats ERMA of Antelope Hunt Areas 68, 69, and 106 are managed with Category 3 restrictions from September 1 to October 22.	Cooperatively develop mitigation measures to reduce the impact or intensity of disruptive activities in the Agate Flats ERMA of Antelope Hunt Areas 68, 69, and 106.	Do not designate this as an ERMA but cooperatively develop mitigation measures to reduce the impact or intensity of disruptive activities in Antelope Hunt Areas 68, 69 and 106. Mineral and realty actions in these areas are open with standard stipulations.
GREEN MOUNTAIN ERMA. See the Green Mountain ACEC section for additional management actions and allowable use decisions for those portions of the ERMA within the ACEC.					
6122	LR: 13.1, 13.3	No similar action.	Increase back country acreage in the Whiskey Peak area from 10,250 acres to 13,780 acres.	Maintain existing back country acreage in the Whiskey Peak area (10,250 acres).	Same as Alternative C.
6123	LR: 13.1, 13.2, 13.3	Maintain the Green Mountain Loop to provide access and opportunities for low clearance vehicles.	Same as Alternative A, plus enhance wildlife and wild horse viewing opportunities and consider additional watchable wildlife interpretation opportunities.	Same as Alternative B.	Same as Alternative B.
6124	LR: 12.1, 12.2, 12.3, 13.1, 13.2, 13.3	Additional management actions and allowable use decisions for the Green Mountain ERMA are contained in the ACEC section.	Same as Alternative A.	Do not manage the Green Mountain area as an ERMA.	Same as Alternative A.

Table 2.33. 7000 Special Designations (SD) – Congressionally Designated Trails

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal SD: 1 Provide users with opportunities to view, experience, and appreciate examples of prehistoric and historic human use of the resources along the Congressionally Designated Trails showing the ways these resources are being managed (1) in harmony with the environment, (2) in support of the nature and purposes for which the trail was established, and (3) yet do not detract from the overall experience of the trail.</p> <p>Objectives:</p> <p>SD: 1.1 VRM Class I Objective: Preserve the existing character of the landscape. Provide for natural ecological changes; however, preserving the landscape will not preclude very limited management activity. The level of change to the characteristic landscape will be very low and will not attract attention.</p> <p>SD: 1.2 VRM Class II Objective: Retain the existing character of the landscape. The level of change to the characteristic landscape will be low. Management activities may be seen, but will not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.</p> <p>SD: 1.3 VRM Class III Objective: Partially retain the existing character of the landscape. The level of change to the characteristic landscape will be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes will repeat the basic elements found in the predominant natural features of the characteristic landscape.</p> <p>SD: 1.4 VRM Class IV Objective: Allow management activities that require major modification to the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt will be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements found in the predominant natural features of the characteristic landscape.</p> <p>Goal SD: 2 Maintain the CDNST corridor to provide high-quality scenic, primitive hiking, and horseback riding opportunities, and to conserve natural historic and cultural resources along the trail.</p> <p>Goal SD: 3 Use of the CDNST will minimally affect adjacent natural and cultural environments and harmonize with the management objectives of land and resource uses which are or may be occurring on the lands through which the trail passes.</p> <p>Goal SD: 4 Preserve and protect the historical remains and historical settings of the Oregon, Mormon Pioneer, California, and Pony Express NHTs and their associated historic sites for public use and enjoyment.</p> <p>Objectives:</p> <p>SD: 4.1 Maintain and enhance the significant qualities of high-potential NHT segments and sites as defined in the National Trails System Act. Avoid adverse effects (as defined in the NHPA and the BLM/SHPO Wyoming State Protocol) upon intact NHT segments, their settings, and associated sites.</p>					

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>SD: 4.2 Protect remnants, ruts, traces, graves, campsites, landmarks, artifacts, and other remains associated with the NHTs to enhance historical research and public use and enjoyment.</p> <p>Goal SD: 5 Provide for the outdoor recreation needs of an expanding population and promote the preservation of public access and enjoyment of the open air, outdoor areas, and historic resources of the nation, in a manner that supports the nature and purpose of the Congressionally Designated Trails.</p> <p>Objectives:</p> <p>SD: 5.1 Manage the landscape (viewshed) associated with the NHTs so that visitors continue to get a sense of how this landscape influenced emigrants along the trails.</p> <p>SD: 5.2 Manage SRMAs along Congressionally Designated Trails for specific visitors, affected community residents, local governments and private sector businesses, or other constituents and the communities or places where these customers originate (recreation-tourism market).</p> <p>SD: 5.3 Congressionally Designated Trails SRMA Objective: Specific outcome-focused objectives, recreation setting character conditions, and the administrative, marketing, and monitoring framework can be found in Appendix C (p. 1453).</p> <p>SD: 5.4 Congressionally Designated Trails visitor Services Resource Protection Objective: Increase awareness, understanding, and a sense of stewardship in NHTs recreational activity participants so their conduct safeguards cultural and natural resources as defined by Wyoming Standards for Public Land Health and other resource objectives.</p> <p>SD: 5.5 Congressionally Designated Trails visitor Health and Safety Objective: Ensure that visitors are not exposed to unhealthy or unsafe human-created conditions (defined by a repeat incident in the same year, of the same type, in the same location, due to the same cause).</p> <p>SD: 5.6 Congressionally Designated Trails use/User Conflict Objective: Achieve a minimum level of conflict between recreation participants and (1) other resource/resource uses sufficient to enable the achievement of identified land use plan goals, objectives, and actions; (2) private land owners sufficient to curb illegal trespass and property damage; and (3) other recreation participants sufficient to maintain a diversity of recreation activity participation.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7001	SD: 4.2, 5.1, 5.2, 5.3, 5.6	Continue to allow for all recreation activity types in an area recognized as a SRMA or RMZ along a Congressionally Designated NHT unless otherwise specified in this Land Use Plan or subsequent activity level plan.			
7002	SD: 5.6	The NHTs and CDNST are open to livestock grazing.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
CONGRESSIONALLY DESIGNATED TRAIL ALLOCATIONS AND DESIGNATIONS					

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7003	SD: 1.2, 4, 4.1, 4.2	Designate lands within ¼ mile of either side of the NHTs as a 27,728 acre ACEC (Map 124). No portion of the CDNST is designated as an ACEC but a portion of the CDNST is co-located with the Seminole Cutoff section of the NHTs ACEC.	Designate the National Historic Trails Management Corridor including the lands within 5 miles on each side of the NHTs as a 468,183 acre ACEC (Map 125). Designate the visible area within 5 miles of the CDNST from Unnamed Spring (out of view of Happy Springs oil field) northwest to the Lander Field Office boundary (near South Pass City) as a 259,380 acre ACEC to protect nationally important scenic values (Map 121).	Recognize ¼ mile on either side of the NHT as the NLCS landscape associated with the NHTs (Map 126). Recognize ¼ mile on either side of the CDNST as the NLCS landscape associated with the trail.	Manage lands associated with the Congressionally Designated Trails as the NTMC with the allocations described below (Map 127, 481,557 acres). Designate the lands in the western end of the NTMC as the South Pass Historical Landscape ACEC (124,229 acres). The remaining part of the corridor is not designated as an ACEC.
7004	SD: 2, 3	The 1987 RMP recognizes the entire CDNST and NHT as an SRMA (with detailed management deferred to future planning). No additional land use allocations or allowable use decisions accompany the SRMA designation.	The following trail related areas and associated RMZs are recognized as SRMAs for the protection of recreation outcomes and settings: CDNST Destination SRMA (82,778 acres) (Map 91): This SRMA includes two RMZs: 1. Alkali Basin RMZ (37,384 acres) is sustained or enhanced for thru-travelers and middle-country hunters to engage in horseback riding, hiking, hunting, and mountain biking so that visitors indicate a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453). 2. Sweetwater Mining RMZ (45,394 acres) is sustained or enhanced for day travelers	No CDNST SRMA exists in this alternative, see ERMA alternatives below.	Same as Alternative B, except the National Trails Undeveloped SRMA is 92,598 acres (Map 93).

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<p>and CDNST thru-travelers to engage in cultural site visitation, driving for pleasure, photography, horseback riding, hiking, and mountain biking so that visitors indicate a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>National Trails Undeveloped SRMA (95,711 acres) (Map 91):</p> <p>This SRMA is sustained or enhanced for individuals or small groups of historic trail “rut buffs,” CDNST thru-hikers, and middle-country hunters to engage in cultural site visitation, driving for pleasure, photography, horseback riding, hunting, and hiking so that visitors indicate a higher than average realization of experience and benefit outcomes listed in Appendix C (p. 1453).</p> <p>NHT Destination SRMA (62,331 acres) (Map 91):</p> <p>This SRMA includes two RMZs:</p> <p>1. Auto Tour Route RMZ (25,098 acres) is sustained or enhanced for highway travelers to engage in historic site visitation/learning, teaching history, photography, and driving for pleasure</p>		

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<p>visitors indicate a higher than average realization of experience and benefit outcomes.</p> <p>2. Group Use RMZ (37,233 acres) is sustained or enhanced for organized groups and other trail enthusiasts to engage in physically demanding cultural site visitation/learning, photography, and historic reenactments so that visitors indicate a higher than average realization of experience and benefit outcomes.</p>		
7005	SD: 2, 3	No similar action.	<p>Trail-related ERMAs:</p> <p>The following trail areas are recognized as ERMAs where visitor services are focused on limiting recreational use impact, ensuring visitor safety, reducing recreational conflicts, and supporting the nature and purpose of the associated Congressionally Designated Trails.</p> <p>Recognize lands within ¼ mile of the CDNST, from Happy Springs Oil Field east to the Lander Field Office boundary in the Crooks Gap area (the CDNST ERMA [4,589 acres]):</p> <p>Recognize lands within ¼ mile on either side of the NHT not encompassed in a SRMA and the Willow Creek area as ERMAs (34,724 acres):</p>	<p>Trail-related ERMAs:</p> <p>The following trail areas are recognized as ERMAs where visitor services are focused on limiting recreational use impact, ensuring visitor safety, and reducing recreational conflicts.</p> <p>CDNST ERMA (14,010 acres):</p> <p>Recognize ¼ mile on either side of the CDNST as the CDNST ERMA.</p> <p>NHT ERMA (30,436 acres):</p> <p>Recognize ¼ mile on either side of the NHT as the NHT ERMA.</p>	Same as Alternative B.

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			Recognize lands in close proximity to the NHT not encompassed in a SRMA as the NHT ERMA (see Map 91).		
7006	SD: 2, 3	<p>Manage ¼ mile on either side of the NHTs as VRM Classes I and II.</p> <p>Since the CDNST was not designated in the 1987 RMP, the VRM land use allocations for the CDNST landscape did not recognize the need to manage the visual resources of the trail. VRM Class designations within 15 miles on each side of the CDNST are as follows:</p> <ul style="list-style-type: none"> • VRM Class I: 2% (11,241 acres) • VRM Class II: 14% (114,962 acres) • VRM Class III: 5% (41,494 acres) • VRM Class IV: 79% (627,569 acres) 	<p>Manage the NHT and associated landscapes as:</p> <ul style="list-style-type: none"> • VRM Class II within 15 miles in all directions • VRM Class III for all designated NHTs crossings. <p>In order to maintain the scenic character of the CDNST, recognize the sensitive nature of the landscape as directed by the 2009 CDNST comprehensive plan and provide for SRMAs. VRM Class designations within 15 miles on each side of the CDNST are as follows:</p> <ul style="list-style-type: none"> • VRM Class I: 1% (11,370 acres) • VRM Class II: 88% (715,468 acres) • VRM Class III: 6% (45,502 acres) • VRM Class IV: 5% (42,185 acres) 	Manage ¼ mile on either side of Congressionally Designated Trails as VRM Class II.	<p>Manage the NTMC Corridor as VRM Class II. The designated utility crossings and the CDNST ERMA are VRM Class III.</p> <ul style="list-style-type: none"> • On a case-by-case basis, remove or reclaim visually intrusive existing roads, facilities, and ROWs not necessary to attain NHT or CDNST management objectives.
CONGRESSIONALLY DESIGNATED TRAILS ALLOWABLE USES AND MANAGEMENT ACTIONS					

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7007	SD: 4.1, 4.2, 5.2, 5.3, 5.6	<p>Range improvement projects and mineral supplementation and their associated impacts are subject to the following restrictions (Map 124):</p> <ul style="list-style-type: none"> Projects are avoided within ¼ mile on each side of designated portions of the NHTs or the visible horizon, whichever is closer. <p>The area beyond ¼ mile from the NHTs is subject to standard Protocol and NHPA measures to minimize the effects to the NHTs.</p>	<p>Range improvement projects and mineral supplementation and their associated impacts are subject to the following restrictions (Map 125):</p> <ul style="list-style-type: none"> Do not authorize projects within 3 miles on each side of the NHTs unless the project and its associated impacts are not visible from the NHTs. <p>Do not authorize projects 3 to 5 miles on each side of the NHTs unless the project and its associated impacts cause no more than a weak contrast, as defined in the BLM Visual Resource Manual.</p>	Same as Alternative A, except apply the standard NHPA measures to Condition Class I and II Historic Trail segments only, and not to Condition Class III and IV Historic Trail segments (Map 122).	Range projects and mineral supplementation and their associated impacts within the NTMC are allowed consistent with VRM Class objectives (Map 78).
7008	SD: 2.2, 3.1, 3.2, 3.3, 4.1, 4.2, 5.1, 5.2, 5.3, 5.5, 5.6	<p>CDNST - Mineral and realty actions are reviewed on a case-by-case basis and mitigation is applied through activity level planning. Mineral and realty actions in the CDNST SRMA area are managed with Category 2 restrictions.</p> <p>NHTs - Mineral and realty actions are subject to the following restrictions (Map 123):</p> <ul style="list-style-type: none"> Mineral and realty actions within ¼ mile on each side of designated portions of the NHTs or the visible horizon, whichever is closer, are managed with Category 4 restrictions. A Plan of Operations is required for locatable mineral activities. 	<p>CDNST - Mineral and realty actions in the CDNST ACEC are managed with Category 4 restrictions.</p> <p>NHTs - Mineral and realty actions, except for highly visible projects and/or projects out of scale with the surrounding environment (e.g., wind farms, gas plants, large transmission lines, and power plants), are subject to the following restrictions (Map 125):</p> <ul style="list-style-type: none"> Mineral and realty actions within 5 miles on each side of the NHTs are managed with Category 6 restrictions unless the proposed project and its associated impacts are not visible from the NHTs. (The historic sites listed under 	<p>CDNST - Mineral and realty actions in the CDNST ERMA area are managed with Category 1 restrictions. Visitor services and facilities may be relocated or removed as necessary to accommodate BLM-authorized actions.</p> <p>NHTs - Same as Alternative A for the NHTs, except apply the restrictions for NHTs and sites to Condition Class I and II Historic Trail segments only, and not to Condition Class III and IV Historic Trail segments.</p>	<p>Mineral and realty actions in the NTMC are managed with the following prescriptions:</p> <ul style="list-style-type: none"> Open to oil and gas leasing subject to NSO stipulations Closed to geophysical exploration within 1 mile of each trail. All trail-related SRMAs are closed to geophysical exploration between June 1 and October 31 to avoid conflicts during the heavy recreational use period. Closed to phosphate leasing Locatable mineral entry: <ul style="list-style-type: none"> Existing locatable mineral withdrawals are retained. These include: <ul style="list-style-type: none"> Split Rock area (645 acres)

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		<ul style="list-style-type: none"> Mineral and realty actions in the area from ¼ mile to 5 miles from the NHTs are managed with Category 2 restrictions. Mineral and realty actions in the Ice Slough area (1,367 acres) are managed with Category 4 restrictions (Map 123). Mineral and realty actions in the Split Rock area (645 acres) are managed with Category 5 restrictions (Map 123). Mineral and realty actions in the Rocky Ridge area (833 acres) are managed with Category 5 restrictions (Map 123). Mineral and realty actions in the Martins Cove area (603 acres) are managed with Category 5 restrictions (Map 123). Mineral and realty actions in the other Oregon Trail withdrawal areas (315 acres) are managed with Category 5 restrictions. Mineral and realty actions in the Devil's Gate area (395 acres) are managed with Category 5 restrictions (Map 123). 	<p>Alternative A are within the 0- to 5-mile zone.)</p> <ul style="list-style-type: none"> Mineral and realty actions within 5 to 15 miles on each side of the NHTs are managed with Category 2 restrictions unless the proposed project and its associated impacts are not visible from the NHTs. 		<ul style="list-style-type: none"> Rocky Ridge area (833 acres) Martins Cove area (603 acres) Devil's Gate area (395 acres) Other Oregon Trail withdrawals (315 acres) The ruts and swales of the NHTs and 10 feet on each side of the ruts and the following individual sites are closed to pursue locatable mineral withdrawal: <ul style="list-style-type: none"> Gillespie Place area (41 acres) Rock Creek Hollow (51 acres) Ice Slough (110 acres) Realty actions and mineral material disposals: <ul style="list-style-type: none"> Except in designated utility corridors, realty actions and mineral material disposals are avoided. Industrial wind-energy development is excluded. Electrical transmission and distribution ROWs will be located only in designated utility corridors, except to deliver power to end users. No realty actions and mineral material disposals will be authorized if it is determined by the Authorized Officer that

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<p>impacts (both direct and cumulative) associated with the action will conflict with the nature and purpose of the Congressionally Designated Trails.</p> <ul style="list-style-type: none"> ○ Realty actions and mineral material disposals associated with access and improvements on private land will be authorized if it is determined by the Authorized Officer that the following can be achieved: <ul style="list-style-type: none"> ■ They create no more than a weak contrast as viewed from the Congressionally Designated Trails; and ■ They meet VRM designations for the disturbance area, as viewed from Key Observation Points impacted by the disturbance. ● Other realty actions and mineral material disposals will be authorized if it is determined by the Authorized Officer that the following can be achieved: <ul style="list-style-type: none"> ○ They are hidden from the Congressionally Designated Trails; and ○ They meet the VRM designation for the disturbance area, as viewed from Key Observation

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<p>Points impacted by the disturbance.</p> <ul style="list-style-type: none"> Pursue opportunities to acquire lands within the NTMC to support the goals and objectives of the Corridor. Lands within the Corridor may be disposed of if subject to an easement or other restriction on use that would ensure conformity with the goals and objectives of the Corridor and the disposal would serve important public values.
TRAIL AND SITE-SPECIFIC ALLOWABLE USES AND MANAGEMENT ACTIONS					
CONTINENTAL DIVIDE NATIONAL SCENIC TRAIL					
7009	SD: 3.2	No allowable use decisions currently exist for the CDNST and its surrounding landscape. Review actions on a case-by-case basis and apply mitigation through the activity level planning process.	At a minimum, apply restrictions (site-specific relocation) on developed (and future) recreation sites and to mapped (and future) national/regional trails, local system trails that connect communities, and trailheads and interpretive sites with exceptional recreation values or significant public interest.	When a proposed or BLM-authorized activity is deemed to threaten the health and safety of trail users, relocate the CDNST within the area defined as the “zone of concern” (50 miles on either side of the physical continental divide) as established by the CDNST advisory council. In the event the trail cannot be practically relocated, identify adequate site-specific mitigation measures and make trail users aware of the potential threat or safety hazard.	Same as Alternative B.

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7010	SD: 3.2	No similar action.	No BLM-authorized activity will expose CDNST trail users to heavy/frequent motorized traffic, unless the proposed activity is in an area of the CDNST that is located on or near an existing ROW or a maintained roadway.	Same as Alternative A.	Motorized vehicle crossings or use on the CDNST is managed in accordance with the 2009 Comprehensive Plan. The BLM will not authorize activities that will expose CDNST trail users to heavy/frequent motorized traffic along the trail unless the proposed activity is within a location that currently experiences heavy/frequent motorized traffic (county and BLM-maintained roads).
NATIONAL HISTORIC TRAILS					
7011	SD: 4.1, 4.2, 5.1, 5.2, 5.3, 5.5, 5.6	NHT crossings by ROWs are subject to the following restrictions: <ul style="list-style-type: none"> Allow NHT crossings by new major utility systems in areas where trail ruts have been modified by modern uses, where previous crossings exist, or where new corridor crossings would not damage trail remains. Require that all crossings avoid fragile trail resources. 	<p>Allow NHT crossings by new major systems only in designated utility corridors.</p> <p>Designate the following route as a utility corridor across the NHTs (Map 106):</p> <ul style="list-style-type: none"> The Lost Creek Corridor, which runs north/south from Wamsutter to Lysite <p>Near the crossing of the NHTs:</p> <ul style="list-style-type: none"> 0 to 5 miles north of the NHTs corridor, the corridor would be 400 feet wide 0 to 2 miles south of the NHTs corridor, the corridor would be 400 feet wide 	Same as Alternative A, except apply the restrictions to Condition Class I and II Historic Trail segments only, and not to Condition Class III and IV Historic Trail segments (Map 122).	<p>Allow NHT crossings by new major utility systems only in designated utility corridors.</p> <p>Designate the following routes as utility corridors across the NHTs:</p> <ul style="list-style-type: none"> Lost Creek Corridor (Map 108). This corridor is for above and below ground ROW. Lost Creek Lateral Corridor (Map 108). This corridor is for below ground ROW only. Pathfinder Reservoir/Sinclair Corridor (Map 108). This corridor is for below ground ROW only. Bison Basin Road Corridor (Map 108). This corridor is for below ground lines only, and must follow the criteria listed in Appendix E (p. 1483). For all of the above designated corridors, where a proposed project is close enough to

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<p>adversely impact the NHTs, the project shall employ every feasible practice to limit disturbance to as small an area as possible. These practices include, but are not limited to:</p> <ul style="list-style-type: none"> ○ Reducing the amount of surface disturbance as much as possible; ○ Co-locating the project ROW unless the proponent can clearly demonstrate that it cannot be co-located; ○ Confining new disturbance within existing disturbance areas, unless the proponent can clearly demonstrate that it cannot be confined; ○ Locating the new project within or immediately adjacent to existing disturbance zones, unless the proponent can clearly demonstrate why it cannot be done; ○ Bore under high-quality ruts; ○ Additional mitigation and BMPs will be developed in response to site-specific proposals.

7000 SPECIAL DESIGNATIONS (SD) – CONGRESSIONALLY DESIGNATED TRAILS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7012	SD: 4.1, 4.2, 5.1, 5.2, 5.3, 5.5, 5.6	Authorize highly visible projects and/or projects out of scale with the surrounding environment (such as plants and power plants) on a case-by-case basis avoiding adverse impacts to the NHTs.	Highly visible projects and/or projects out of scale with the surrounding environment are subject to the following restrictions: <ul style="list-style-type: none"> Mineral and realty actions within 20 miles on each side of the NHTs are managed with Category 5 restrictions unless the proposed project and its associated impacts are not visible from the NHTs. 	Same as Alternative A.	Highly visible projects and/or projects out of scale with the surrounding environment (such as large wind-energy development projects, gas plants, power plants, high voltage transmission lines, etc.) are subject to the following restriction: <ul style="list-style-type: none"> Projects of this type outside of the NTMC are authorized only if the project causes no more than a weak contrast, as defined in the BLM Visual Resource Manual.
7013	SD: 4.1, 4.2, 5.2, 5.3, 5.6	New audible (noise) and atmospheric (smoke, dust, etc.) effects to the NHTs are subject to NHPA measures to minimize the impacts to the NHTs.	New audible and atmospheric effects will not exceed current levels existing along the NHT corridors.	Same as Alternative A.	Same as Alternative B.

Table 2.34. 7000 Special Designations (SD) – Wilderness Study Areas

7000 SPECIAL DESIGNATIONS (SD) – WILDERNESS STUDY AREAS					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal SD: 6 Manage WSAs so as to not impair the suitability of such areas for preservation as wilderness.</p> <p>Objectives:</p> <p>SD: 6.1 Preserve wilderness characteristics in WSAs in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i>, until Congress either designates these lands as Wilderness or releases them for other purposes.</p> <p>SD: 6.2 SRMA Objective for the Sweetwater Rocks and Sweetwater Canyon WSAs: See Appendix C (p. 1453) for specific outcome-focused objectives, recreation setting character conditions, and the administrative, marketing, and monitoring framework.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7014	SD: 6	Under BLM guidance, the BLM does not have the authority to designate new WSAs nor does BLM have the authority to reverse, repeal, or amend existing WSAs.			
7015	SD: 6.1, 6.2	<p>The following eight WSAs are managed under BLM Manual 6330, <i>Management of Wilderness Study Areas</i> (Map 128):</p> <ul style="list-style-type: none"> ● Sweetwater Rocks Complex: <ul style="list-style-type: none"> ○ Split Rock (13,964 acres) ○ Lankin Dome (6,347 acres) ○ Miller Spring (6,697 acres) ○ Savage Peak (7,178 acres) ○ Sweetwater Canyon (9,135 acres) ● Whiskey Mountain (519 acres) ● Copper Mountain (6,936 acres) ● Dubois Badlands (4,561 acres) 			
7016	SD: 6.1	Manage all WSAs as VRM Class I visual resources (Map 128).			
7017	SD: 6.1	Grandfathered uses (as defined in BLM Manual 6330, <i>Management of Wilderness Study Areas</i>) are allowed on lands under Wilderness review in the manner and degree in which these uses were performed on October 21, 1976, so long as they do not cause unnecessary or undue degradation of the lands.			
7018	SD: 6.1	Non-Grandfathered uses (as defined in BLM Manual 6330, <i>Management of Wilderness Study Areas</i>) are subject to the non-impairment standard discussed in Objective SD: 6.1.			
7019	SD: 6.1	Livestock grazing in all WSAs, including the Sweetwater Canyon WSA, is managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . See the Recreation section for management actions associated with the Sweetwater Canyon SRMA.			
7020	SD: 6.2	In the event Congress releases any of the Lander Field Office WSAs without management direction, the BLM will continue to manage the released area(s) under similar direction as detailed in BLM Manual 6330, <i>Management of Wilderness Study Areas</i> until a Land Use Plan amendment is developed detailing management direction for the area(s). The Land Use Plan amendment process will include updated inventories, recreational user surveys, community workshops, detailed adjacent land use analysis, etc. in order to ensure management of released areas is consistent with the existing plan and meets the future needs of the American public.			

7000 SPECIAL DESIGNATIONS (SD) – WILDERNESS STUDY AREAS					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7021	N/A	Additional allocations, allowable uses, and management actions to support recreation in WSAs can be found in the Recreation section.			
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7022	SD: 6.1	Close the Dubois Badlands WSA to motorized travel (Map 128). Limit motorized travel in the following WSAs to designated roads and trails that existed and were identified before or during the inventory phase of the wilderness review (Map 128): <ul style="list-style-type: none">● Sweetwater Rocks Complex:<ul style="list-style-type: none">○ Split Rock (13,964 acres)○ Lankin Dome (6,347 acres)○ Miller Spring (6,697 acres)○ Savage Peak (7,178 acres)● Sweetwater Canyon (9,135 acres)● Whiskey Mountain (519 acres)● Copper Mountain (6,936 acres)	Close all WSAs to motorized and mechanized travel (Map 128).	Same as Alternative A.	The following WSAs with the same acreage as in Alternative A are closed to motorized travel (Map 128): <ul style="list-style-type: none">● Dubois Badlands● Copper Mountain● Whiskey Mountain In the following WSAs motorized travel is limited to designated roads and trails that existed and were identified before or during the inventory phase of the wilderness review. Travel systems and linear features in conflict with wilderness values will be modified (mitigated or closed) through implementation planning (Map 128). <ul style="list-style-type: none">● Sweetwater Rocks Complex:<ul style="list-style-type: none">○ Split Rock○ Lankin Dome○ Miller Spring○ Savage Peak● Sweetwater Canyon

Table 2.35. 7000 Special Designations (SD) – Wild and Scenic Rivers

7000 SPECIAL DESIGNATIONS (SD) – WILD AND SCENIC RIVERS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 7 Protect outstanding remarkable values of eligible and suitable WSR waterway segments recommended for inclusion in the NWSRS.					
Objective:					
SD: 7.1 Maintain the outstandingly remarkable scenic, recreational, and wild values of all segments of waterways found to be eligible and suitable for inclusion in the NWSRS.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7023	SD: 7.1	Do not authorize stream impoundments, channelization, and/or rip-rapping along BLM shorelines of eligible waterways. BLM-administered lands within ¼ mile on either side of eligible waterways are closed to land disposal actions unless the disposal would be subject to an easement or other restriction on use that would ensure conformity with the goals and objectives of the waterway management and the disposal would serve important public values. Exchanges of BLM-administered lands outside of the corridor could be considered for acquiring private or state lands within the corridor or between public land parcels along the creek; however, BLM-administered lands within the corridor will not be exchanged unless it benefits the goals and objectives of the management.			
7024	SD: 7.1	Any fire suppression activities on BLM-administered lands within ¼ mile on either side of eligible waterways will use ‘light-on-the land’ techniques. No motorized vehicle ground equipment should be used to suppress fires. Air tanker and helicopter bucket drops and the use of chainsaws may be allowed if no permanent impacts would occur. Evaluate any fire rehabilitation plans to determine whether they comply with the interim management stipulations for a wild waterway area.			
7025	SD: 7.1	Vegetation treatment and manipulation on BLM-administered lands within ¼ mile on either side of eligible waterways must be consistent with guidance provided for the interim management of wild waterway areas under the Wild and Scenic River Act. Timber sales are not authorized in the ¼-mile area on either side of eligible waterways.			
7026	SD: 7.1	To resist invasion by noxious weeds, manage native plant communities and soils within ¼ mile on either side of eligible waters to maintain an ecologically healthy and vigorous condition. Control noxious weeds and undesirable invasive species using integrated pest management.			
MANAGEMENT ACTIONS BY ALTERNATIVE					

7000 SPECIAL DESIGNATIONS (SD) – WILD AND SCENIC RIVERS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7027	SD: 7.1	<p>Apply interim management to the 9 eligible waterways to protect the free-flowing outstandingly remarkable values and tentative classification. Eligible waterways include the following (Map 129):</p> <ul style="list-style-type: none"> ● Baldwin Creek Unit: 8.1 miles (Wild, Scenic) <ul style="list-style-type: none"> ○ Upper Baldwin Creek Segment: 6.96 miles (Wild, Scenic) ○ Lower Baldwin Creek Segment: 1.14 miles (Wild) ● Sweetwater River Unit: 12.88 miles (Wild) <ul style="list-style-type: none"> ○ Sweetwater River Segment: 8.64 miles (Wild) ○ Granite Creek Segment: 1.04 miles (Wild) ○ Mormon Creek Segment: 1.08 miles (Wild) ○ Willow Creek Segment: 1.32 miles (Wild) ○ Strawberry Creek Segment: 0.81 miles (Wild) ● Ice Slough Segment: 1.6 miles (Recreational) ● Little Popo Agie River Segment: 1.5 miles (Wild) ● North Popo Agie River Segment: 0.7 miles (Wild) ● Rock Creek Segment: 4.0 miles (Scenic) ● Warm Springs Creek Segment: 1.3 miles (Scenic) ● Willow Creek (South Pass) Segment: 1.3 miles (Scenic) 	Same as Alternative A, plus recommend all 9 eligible waterways as suitable for inclusion in the NWSRS (Map 129). Manage these waterways to maintain or enhance the suitability.	Recommend none of the 9 eligible waterways as suitable for inclusion in the NWSRS. Manage these areas in accordance with other resource and use prescriptions.	<p>Recommend the Baldwin Creek Unit, Warm Springs Segment 1 only (1.3 miles), and Sweetwater River Unit as identified in Alternative A as suitable for inclusion in the NWSRS (Map 129).</p> <p>Manage these waterways to maintain or enhance the suitability. Do not authorize timber sales upstream of the waterways unless the waterway would not be adversely impacted by timber removal. Work cooperatively with other land owners and managers to avoid adverse impacts to the waterways.</p>

7000 SPECIAL DESIGNATIONS (SD) – WILD AND SCENIC RIVERS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
		<ul style="list-style-type: none"> Wind River Segment: 0.5 miles (Scenic) <p>Manage these waterways to maintain or enhance the suitability. Do not authorize timber sales upstream of the waterways unless the waterways would not be adversely impacted by timber removal. Work cooperatively with other land owners and managers to avoid adverse impacts to the waterways. Chapter 2 of the WSR report (BLM 2002a) provides a complete description of the above waterway segments and interim management.</p>			
INTERIM MANAGEMENT OF IDENTIFIED ELIGIBLE WATERWAYS					
7028	SD: 7	Interim management for eligible waterways will ensure protection of free-flowing values, documented outstanding remarkable values, and ensure maintenance of tentative river classification. Detailed interim management for the Baldwin Creek and Sweetwater River Unit has been further developed as discussed below.	Waterways recommended as suitable for inclusion in the NWSRS are managed as detailed below. Management will protect free-flowing values, outstanding remarkable values, and ensure maintenance of eligible and suitable classifications.	No eligible waterway is recommended as suitable for inclusion in the NWSRS; therefore management of these areas will not be required to maintain WSR characteristics.	Same as Alternative B.
7029	SD: 7.1	The Baldwin Creek Unit is within the Lander Slope ACEC and managed in accordance with ACEC prescriptions. The Sweetwater River Unit is within the Sweetwater Canyon WSA and managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . There are no WSR management prescription.	Prohibit any activities that diminish the free-flowing character of the waterway, or outstanding remarkable values, and/or any physical or visual intrusions on the eligible and suitable waterways.	Same as Alternative A for the Sweetwater Canyon WSA. No similar action for the Baldwin Creek Unit.	Same as Alternative B.

7000 SPECIAL DESIGNATIONS (SD) – WILD AND SCENIC RIVERS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7030	SD: 7.1	Mineral and realty actions in the Baldwin Creek Unit are managed with Category 3 restrictions and in the Sweetwater Canyon WSA are managed under BLM Manual 6330, <i>Management of Wilderness Study Areas</i> .	Mineral and realty actions within ¼ mile of eligible and suitable waterways are managed with Category 6 restrictions. Allow existing mineral leases to expire.	Same as Alternative A, except mineral and realty actions in the Baldwin Creek Unit are managed with Category 1 restrictions.	Same as Alternative A. Mineral and realty actions in the ACEC are managed as follows: <ul style="list-style-type: none"> • Open to oil and gas leasing subject to NSO stipulations • Closed to geophysical exploration • Closed to phosphate leasing • Open to locatable minerals • Closed to mineral material sales • Excluded to major ROWs • Avoided for minor ROWs
7031	SD: 7.1	Water impoundments, diversions, or hydroelectric power facilities are subject to mitigation measures necessary to maintain free flowing characteristics.	Prohibit water impoundments, diversions, or hydroelectric power facilities in eligible and suitable WSR waterway segments.	Same as Alternative A for the Sweetwater Canyon Unit. No similar action for the Baldwin Creek Unit.	Same as Alternative B.
7032	SD: 7.1	Limit motorized travel in the Baldwin Creek Unit and Sweetwater River Unit to designated roads and trails.	Close the Baldwin Creek Unit and the Sweetwater River Unit to motorized and mechanized travel.	Limit motorized travel in the Baldwin Creek Unit to existing roads and trails. Limit motorized travel in the Sweetwater River Unit to designated roads and trails.	Close the Baldwin Creek Unit to motorized travel. Motorized travel in the Sweetwater River and Warm Springs Units will be limited to designated roads and trails.
7033	SD: 7.1	Commercial timber sales and harvests in the Baldwin Creek Unit are subject to VRM Class II requirements. Commercial timber sales and harvests in the Sweetwater Canyon Unit are subject to BLM Manual 6330, <i>Management of Wilderness Study Areas</i> .	Close BLM-administered lands within the Baldwin Creek, Warm Springs, and Sweetwater River Units to commercial timber sales or harvesting. Prohibit cutting or removal of forest products and stand conversion type treatments.	Same as Alternative A for the Sweetwater River Unit. No similar action for the Baldwin Creek Unit.	Same as Alternative B.

7000 SPECIAL DESIGNATIONS (SD) – WILD AND SCENIC RIVERS					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7034	SD: 7.1	Identification of WSR eligibility does not change livestock grazing management.	The Baldwin Creek and Sweetwater River Units are closed to livestock grazing. On a case-by-case basis, allow construction of new range improvements that protect or enhance outstanding remarkable values and do not result in adverse impacts to the wild classification.	Same as Alternative A.	Manage livestock grazing in the Units to support the outstanding remarkable values. Allow construction of new range improvements that protect or enhance outstanding remarkable values and do not result in adverse impacts to the wild classification.
7035	SD: 7.1	Manage the Baldwin Creek Unit as VRM Class II and the Sweetwater River Units as VRM Class I.	Manage BLM-administered lands within the Baldwin Creek and Sweetwater River Units as VRM Class I.	Same as Alternative A for the Sweetwater River Unit. Manage the Baldwin Creek Unit as VRM Class III.	Same as Alternative B, the Warm Springs Unit will be managed as VRM Class II.
7036	SD: 7.1	Manage eligible waterways under interim management until which time suitability determinations can be made.	Manage waterways considered eligible to improve characteristics which would facilitate future suitability classification.	Same as Alternative A.	Same as Alternative B.

Table 2.36. 7000 Special Designations (SD) – Areas of Critical Environmental Concern

7000 SPECIAL DESIGNATIONS (SD) – AREAS OF CRITICAL ENVIRONMENTAL CONCERN					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 8 Maintain, protect and enhance the relevant and important values for each ACEC and provide opportunities for other compatible uses where appropriate.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7037	SD: 8	Retain lands within the ACECs for long-term management unless the disposal would benefit the goals and objectives of the ACEC such as blocking up land, improving access, or facilitating ACEC management or would otherwise facilitate important public objectives and values. Pursue land acquisition within or near the ACEC to benefit the goals and objectives of the ACEC. Manage the federal mineral estate on split-estate lands located within the boundary of an ACEC consistently with the management of BLM-administered surface lands.			
7038	SD: 8	Develop and implement fire and fuels management in consideration of the resource(s) for which the ACEC is designated with consideration of the WUI, if present.			
7039	SD: 8	Management of the NHTs ACEC is discussed in the NHTs section.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7040	SD: 8	Retain the ACEC designations in the following areas (Map 130): <ul style="list-style-type: none">● Lander Slope (25,065 acres)● Red Canyon (15,109 acres)● Dubois Badlands (4,903 acres)● Whiskey Mountain (8,776 acres)● East Fork (4,431 acres)● Beaver Rim (6,421 acres)● Green Mountain (14,612 acres)● NHTs (27,728 acres): See the Congressionally Designated Trails section for management● South Pass Historic Mining Area (12,576 acres)	Retain the ACEC designation in the following areas (Map 131): <ul style="list-style-type: none">● Lander Slope: Same as Alternative A (25,065 acres)● Red Canyon: Same as Alternative A (15,109 acres)● Dubois Badlands: Same as Alternative A (4,903 acres)● Whiskey Mountain: Same as Alternative A (8,776 acres) Retain and expand the ACEC designation in the following areas (Map 131): <ul style="list-style-type: none">● East Fork: Same as Alternative A, plus 3,313 acres● Beaver Rim: Same as Alternative A, plus 14,111 acres● Green Mountain: Same as Alternative A, plus 10,248 acres● NHTs: Same as Alternative A, plus 440,455 acres. See the	Do not retain the areas identified in the 1987 RMP as ACECs.	Retain the ACEC designations in the following areas (Map 132): <ul style="list-style-type: none">● Lander Slope (25,065 acres)● Red Canyon (15,109 acres)● Whiskey Mountain (8,776 acres)● Beaver Rim (6,421 acres) Retain and expand the ACEC designation in the following areas (Map 132): <ul style="list-style-type: none">● East Fork: Same as Alternative A, plus 3,314 acres● Green Mountain: Same as Alternative A, plus 6,777 acres Designate the South Pass Historic Mining Area and a portion of the CDNST and the NHTs as the following ACEC (Map 132) (see the Congressionally Designated Trails section for management of trails-related lands outside the ACEC):

7000 SPECIAL DESIGNATIONS (SD) – AREAS OF CRITICAL ENVIRONMENTAL CONCERN					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
			<p>Congressionally Designated Trails section for management</p> <ul style="list-style-type: none"> • South Pass Historic Mining Area: Same as Alternative A, plus 10,863 acres <p>Designate the following areas as ACECs (Map 131):</p> <ul style="list-style-type: none"> • Continental Divide National Scenic Trail (259,380 acres): See the Congressionally Designated Trails section for management • Cedar Ridge (7,039 acres) • Castle Gardens (8,469 acres) • Sweetwater Rocks (152,347 acres) • Regional Historic Trails and Early Highways (89,016 acres) • Government Draw/Upper Sweetwater Sage-Grouse (1,246,791 acres) 		<ul style="list-style-type: none"> • South Pass Historical Landscape (124,229 acres) <p>Designate the following area as an ACEC in the Hudson to Atlantic City area (Map 132):</p> <ul style="list-style-type: none"> • Twin Creek (35,102 acres) <p>The WSA portion of the Dubois Badlands ACEC is not designated an ACEC. The ACEC lands outside the WSA (342 acres) are incorporated into the East Fork ACEC.</p> <p>Do not designate the following areas as ACECs but manage to protect the identified relevant and important characteristics. Management for these areas will be moved to the appropriate program:</p> <ul style="list-style-type: none"> • Castle Gardens (see the Castle Gardens ACEC (Proposed) section for management) • Cedar Ridge (see the Cedar Ridge ACEC (Proposed) section for management) • Sweetwater Rocks (see the Sweetwater Rocks ACEC (Proposed) section for management) • CDNST (see the Congressionally Designated Trails section for management within the NTMC) • Regional Historic Trails and Early Highways (see

7000 SPECIAL DESIGNATIONS (SD) – AREAS OF CRITICAL ENVIRONMENTAL CONCERN					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<p>the Regional Historic Trails and Early Highways ACEC (Proposed) section for management)</p> <ul style="list-style-type: none"> • NHTs (see the Congressionally Designated Trails section for management within the NTMC) • Government Draw/Upper Sweetwater Sage-Grouse (1,246,791 acres) (see the Government Draw/Upper Sweetwater Sage-Grouse ACEC (Proposed) for management within this area.)

Table 2.37. 7000 Special Designations (SD) – The Lander Slope ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – THE LANDER SLOPE ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 9 Manage the Lander Slope with the following objectives:					
Objectives:					
SD: 9.1 Maintain adequate winter forage for elk and mule deer so as to support WGFD herd objectives.					
SD: 9.2 Maintain and improve habitat for elk and mule deer and, where appropriate, bighorn sheep so as to support WGFD herd objectives.					
SD: 9.3 Maintain and improve the views of the Lander Slope so that no action has more than a “weak contrast” with the characteristic landscape.					
SD: 9.4 Maintain or improve the water quality in the watershed of the Middle Fork of the Popo Agie River.					
SD: 9.5 Route densities and locations will maintain or enhance the quality of the scenic and wildlife values.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7041	SD: 9	The ACEC is open to livestock grazing and managed to meet the goals and objectives for the ACEC.			
7042	SD: 9	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7043	SD: 9	Designate BLM-administered lands in the Lander Slope area as a 25,065-acre ACEC (Map 130).	Same as Alternative A, but manage in accordance with the prescriptions in the following records.	Do not designate BLM-administered lands in the Lander Slope area as an ACEC.	Same as Alternative A.
7044	SD: 9	Manage different parts of the ACEC as VRM Class II or III.	Manage the ACEC as VRM Class II.	Manage different parts of the former ACEC as VRM Class III or IV.	Same as Alternative B.

7000 SPECIAL DESIGNATIONS (SD) – THE LANDER SLOPE ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7045	SD: 9	Mineral and realty actions in the ACEC are managed with Category 3 restrictions.	Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the former ACEC are managed with Category 1 restrictions.	Mineral and realty actions in the ACEC are managed as follows: <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to NSO stipulations ● Closed to geophysical exploration ● Closed to phosphate leasing ● Closed to pursue withdrawal from locatable mineral entry ● Closed to mineral materials disposal ● Excluded to major ROWs ● Avoided for minor ROWs
7046	SD: 9	Manage plant communities for rangeland health and to protect important wildlife habitat primarily for elk and mule deer and, where appropriate, bighorn sheep.	Manage plant communities to provide elk and mule deer and, where appropriate, bighorn sheep forage.	Manage plant communities to maximize production for all grazing animals.	Same as Alternative A.
7047	SD: 9	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is to enhance ACEC values.
7048	SD: 9	On a case-by-case basis, determine management prescriptions including livestock grazing management of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not allocated for livestock use.	Acquired lands in the former ACEC are open to livestock grazing.	Same as Alternative A.

Table 2.38. 7000 Special Designations (SD) – Red Canyon ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – RED CANYON ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 10 Manage Red Canyon with the following objectives:					
Objectives:					
SD: 10.1 Maintain adequate winter forage for elk, mule deer, and moose so as to support WGFD herd objectives.					
SD: 10.2 Maintain and improve winter habitat for elk, mule deer, moose, and elk calving habitat.					
SD: 10.3 Maintain the views of Red Canyon from Highway 28 and within the Canyon so that no proposed action has more than a weak contrast with the characteristic landscape.					
SD: 10.4 Route densities and locations will maintain or enhance the scenic and wildlife values.					
SD: 10.5 Maintain and improve the habitat for sensitive plant species.					
SD: 10.6 Protect significant prehistoric rock art sites and the complex of petroglyph sites that runs along the east flank of the Wind River Mountain Range that is within the Red Canyon area.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7049	SD: 10	Manage the NNL portion of Red Canyon as VRM Class I.			
7050	SD: 10	The ACEC is open to livestock grazing and managed to meet the goals and objectives for the ACEC. Maintain the 500 AUM forage allocation for elk.			
7051	SD: 10	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7052	SD: 10	Designate BLM-administered lands in the Red Canyon area as a 15,109-acre ACEC (Map 130).	Same as Alternative A, but manage in accordance with the prescriptions in the following records.	Do not designate BLM-administered lands in the Red Canyon area as an ACEC.	Same as Alternative A.
7053	SD: 10	Manage the remainder of the ACEC as VRM Class II.	Same as Alternative A.	Manage the remaining areas of the former ACEC as VRM Class III.	Same as Alternative A.

7000 SPECIAL DESIGNATIONS (SD) – RED CANYON ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7054	SD: 10	Mineral and realty actions in the ACEC are managed with Category 3 and 4 restrictions.	Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the former ACEC are managed with Category 1 restrictions.	Mineral and realty actions in the ACEC are managed as follows: <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to NSO stipulations ● Closed to geophysical exploration ● Closed to phosphate leasing ● Closed to pursue a withdrawal from locatable mineral entry ● Closed to mineral material sales ● Excluded to major ROWs ● Avoided for minor ROWs
7055	SD: 10	Close the ACEC to all winter sport activities from December 1 to June 15.	Close the ACEC to human presence from December 1 to June 15.	Do not close the former ACEC to winter sport activities.	Close the ACEC to human presence from December 1 through April 30 and motorized vehicle use from December 1 through June 15.
7056	SD: 10	Manage plant communities for rangeland health and to protect important wildlife habitat primarily for elk, mule deer, and moose.	Manage plant communities to provide elk, mule deer, and moose forage.	Manage plant communities to maximize production for all grazing animals.	Same as Alternative A.
7057	SD: 10	On a case-by-case basis, undertake treatments for invasive species to protect wildlife and sensitive plant species habitat.	Develop and implement integrated pest management to control and eradicate invasive species to protect wildlife and sensitive plant species habitat.	Same as Alternative A.	Same as Alternative A.
7058	SD: 10	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is to enhance ACEC values.
7059	SD: 10	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	Acquired lands in the former ACEC are open to livestock grazing.	Same as Alternative A.

Table 2.39. 7000 Special Designations (SD) – Dubois Badlands ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – DUBOIS BADLANDS ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 11 Manage Dubois Badlands with the following objectives:					
Objectives:					
SD: 11.1 Maintain and improve winter habitat for bighorn sheep.					
SD: 11.2 Maintain and enhance fragile soils.					
SD: 11.3 Maintain the views of the Dubois Badlands from Highway 28/287 and from the town of Dubois so that no proposed action has more than a weak contrast with the characteristic landscape.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7060	SD: 11	Management prescriptions that are unique to the portion of the Dubois Badlands ACEC that is a WSA are found primarily in the WSA section.			
7061	SD: 11	Manage the Dubois Badlands WSA as VRM Class I.			
7062	SD: 11	Travel and road density in the ACEC are managed to support ACEC and WSA objectives. See the Comprehensive Trails and Travel Management and WSA sections for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7063	SD: 11	Designate BLM-administered lands in the Dubois Badlands area as a 4,903-acre ACEC (Map 130).	Same as Alternative A, but manage in accordance with the prescriptions in the following records.	Do not designate BLM-administered lands in the Dubois Badlands area as an ACEC.	Same as Alternative C, except that the non-WSA lands are managed as part of the East Fork ACEC (Map 132).
7064	SD: 11	Manage the portion of the Dubois Badlands ACEC outside of the WSA as VRM Class II.	Same as Alternative A.	Manage the former ACEC lands outside the WSA as VRM Class III.	Same as Alternative A. See East Fork ACEC for visual resources management for this area.
7065	SD: 11	Manage the WSA portions of the ACEC in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> (see WSA section). Mineral and realty actions on BLM-administered lands outside the WSA are managed with Category 3 restrictions.	Manage the WSA portions of the ACEC in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Manage the WSA portions of the former ACEC in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions on former ACEC lands outside the WSA are managed with Category 1 restrictions.	The WSA is managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . See East Fork ACEC for mineral and realty management for the parcels that had been part of the ACEC in Alternative A that have been added to the East Fork ACEC.

7000 SPECIAL DESIGNATIONS (SD) – DUBOIS BADLANDS ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7066	SD: 11	The ACEC is open to livestock grazing.	Same as Alternative A, except that the parcels in the ACEC outside of the WSA are closed to livestock grazing to provide adequate wildlife forage.	The former ACEC is open to livestock grazing.	The WSA is managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . See East Fork ACEC for livestock grazing management for the non-WSA lands.
7067	SD: 11	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Livestock grazing in the WSA is managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . See East Fork ACEC for the management of non-WSA lands in the ACEC.
7068	SD: 11	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	Acquired lands in the former ACEC are open to livestock grazing.	See East Fork ACEC for the management of non-WSA lands in the ACEC.

Table 2.40. 7000 Special Designations (SD) – Whiskey Mountain ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – WHISKEY MOUNTAIN ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 12 Manage Whiskey Mountain with the following objectives: Objectives: SD: 12.1 Maintain adequate winter forage for bighorn sheep so as to support WGFD herd objectives. SD: 12.2 Maintain and improve winter bighorn sheep habitat. SD: 12.3 Work cooperatively with the WGFD and the USFS to support joint management objectives. SD: 12.4 Route densities and locations will maintain or enhance the scenic and wildlife values.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7069	SD: 12	Manage the Whiskey Mountain WSA as VRM Class I.			
7070	SD: 12	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7071	SD: 12	Designate BLM-administered lands in the Whiskey Mountain area as an 8,776-acre ACEC (Map 130).	Same as Alternative A, but manage in accordance with the prescriptions in the following records.	Do not designate BLM-administered lands in the Whiskey Mountain area as an ACEC.	Same as Alternative A.
7072	SD: 12	Manage the portions of the Whiskey Mountain ACEC outside of the WSA as VRM Class II.	Same as Alternative A.	Manage the portions of the former ACEC outside of the WSA as VRM Class III.	Same as Alternative A.
7073	SD: 12	Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Same as Alternative A.	Manage the WSA portions of the former ACEC in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> . Mineral and realty actions on former ACEC lands outside the WSA are managed with Category 1 restrictions.	Mineral and realty actions in the ACEC are as follows: <ul style="list-style-type: none">● Closed to oil and gas leasing● Closed to geophysical exploration● Closed to phosphate leasing● Proposed for withdrawal from locatable minerals● Closed to mineral material sales● Excluded for major ROWs● Avoided for minor ROWs

7000 SPECIAL DESIGNATIONS (SD) – WHISKEY MOUNTAIN ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7074	SD: 12	Part of the ACEC (2,670 acres) is open to livestock grazing (Map 130).	The ACEC is closed to livestock grazing.	The former ACEC is open to livestock grazing.	Part of the ACEC (2,670 acres) is open to livestock grazing (Map 132). (Closure of CM Whiskey Basin Pasture).
7075	SD: 12	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is to enhance ACEC values.
7076	SD: 12	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	Acquired lands in the former ACEC are open to livestock grazing.	Same as Alternative A.

Table 2.41. 7000 Special Designations (SD) – East Fork ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – EAST FORK ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 13 Manage East Fork with the following objectives:					
Objectives:					
SD: 13.1 Maintain adequate winter forage for elk and bighorn sheep so as to support WGFD herd objectives.					
SD: 13.2 Maintain winter habitat for elk and bighorn sheep.					
SD: 13.3 Work cooperatively with the WGFD to support joint management objectives.					
SD: 13.4 Road densities and locations will maintain scenic and wildlife values.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7077	SD: 13	Visual resources are managed in accordance with prescriptions in the Visual Resources section.			
7078	SD: 13	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7079	SD: 13	Designate BLM-administered lands in East Fork as a 4,431-acre ACEC (Map 130).	Same as Alternative A, but expand the ACEC by 3,313 acres for a total of 7,744 acres (Map 131).	Do not designate BLM-administered lands in East Fork as an ACEC.	Same as Alternative B, plus include 342 acres in the East Fork ACEC transferred from the Dubois Badlands ACEC for a total of 7,745 acres.
7080	SD: 13	Mineral and realty actions in the existing ACEC are managed with Category 6 restrictions. Mineral and realty actions on the land within the proposed expanded ACEC in Alternative B are managed with Category 1 restrictions.	Mineral and realty actions in the expanded ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the former ACEC are managed with Category 1 restrictions.	Mineral and realty actions in the expanded ACEC are managed as follows: <ul style="list-style-type: none">● Closed to oil and gas leasing● Closed to geophysical exploration● Closed to phosphate leasing● Withdrawn from locatable mineral entry (of the 7,745 acres of surface estate in the ACEC, there are 1,290 acres of pre-FLPMA withdrawals and 6,455 acres proposed for withdrawal)

7000 SPECIAL DESIGNATIONS (SD) – EAST FORK ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<ul style="list-style-type: none"> • Closed to mineral material sales • Excluded for major ROWs • Avoided for minor ROWs
7081	SD: 13	The existing ACEC is closed to livestock grazing; 691 acres within the proposed expanded ACEC in Alternative B are open to livestock grazing. The remaining 2,281 acres in the expansion area are not offered for grazing but are not closed.	The ACEC is closed to livestock grazing, except for 641 acres which are open for livestock grazing.	The former ACEC is closed to livestock grazing; 2,972 acres within the proposed expanded ACEC are open to livestock grazing.	Same as Alternative B.
7082	SD: 13	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is to enhance ACEC values.
7083	SD: 13	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the former ACEC.	Same as Alternative A.

Table 2.42. 7000 Special Designations (SD) – Beaver Rim ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – BEAVER RIM ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 14 Manage Beaver Rim with the following objectives:					
Objectives:					
SD: 14.1 Maintain wildlife habitat, especially for raptors.					
SD: 14.2 Maintain the views of Beaver Rim from Highway 287, views from the areas below the Rim, and the views looking out from the Rim.					
SD: 14.3 Maintain the habitat for sensitive plant species and unique plant communities.					
SD: 14.4 Protect significant Traditional Cultural Properties associated with the Rim.					
SD: 14.5 Protect the geological resources of the Rim.					
SD: 14.6 Work cooperatively to improve the educational and recreational values of the Rim.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7084	SD: 14	Beaver Rim is open to livestock grazing and managed to meet the goals and objectives for the area.			
7085	SD: 14	Work cooperatively with partners to develop and implement aggressive plans to control and eradicate invasive species.			
7086	SD: 14	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7087	SD: 14	Designate BLM-administered lands in Beaver Rim as a 6,421-acre ACEC (Map 130).	Same as Alternative A, but expand the ACEC by 14,111 acres for a total of 20,254 acres (Map 131).	Do not designate the BLM-administered lands in Beaver Rim as an ACEC.	Same as Alternative A.
7088	SD: 14	Manage different parts of the ACEC as VRM Class II to IV. (6,421 acres).	Manage different parts of the ACEC as VRM Class II or III.	Manage different parts of Beaver Rim as VRM Class III or IV.	Manage the ACEC as VRM Class II.

7000 SPECIAL DESIGNATIONS (SD) – BEAVER RIM ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7089	SD: 14	Mineral and realty actions in the ACEC are managed with Category 3 restrictions in areas with moderate, low, or no potential for oil and gas. Areas with high potential are managed with Category 1 restrictions. Locatable minerals are subject to restrictions in areas where these activities could cause adverse impacts to other significant resource values. Mineral and realty actions on land within the proposed expanded ACEC in Alternative B are managed with Category 1 restrictions.	Mineral and realty actions in the expanded ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the former ACEC are managed with Category 1 restrictions.	Mineral and realty actions in the ACEC are managed as follows: <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to NSO stipulations ● Oil and gas leasing in the 14,111 acres designated as an expanded ACEC in Alternative B is open subject to an MLP ● Closed to geophysical exploration ● Closed to solid mineral leasing ● Open with a Plan of Operations to locatable minerals ● Closed to mineral material disposal ● Excluded for major ROWs ● Avoided for minor ROWs
7090	SD: 14	On a case-by-case basis, protect sensitive plant species and unique plant communities and focus plant community management on wildlife habitat.	Manage the plant community to provide wildlife habitat and to protect sensitive plant species and unique plant communities.	Same as Alternative A.	Same as Alternative B.
7091	SD: 14	Do not focus management on developing interpretation.	Cooperate with the State of Wyoming and others to develop educational signage, driving loops, and kiosks regarding unique plant communities, unique geology, and visual resources.	Same as Alternative B.	Same as Alternative B.
7092	SD: 14	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is to enhance ACEC values.
7093	SD: 14	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	Acquired lands in the former ACEC are open to livestock grazing.	Same as Alternative A.

Table 2.43. 7000 Special Designations (SD) – Green Mountain ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – GREEN MOUNTAIN ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 15 Manage Green Mountain with the following objectives:					
Objectives:					
SD: 15.1 Maintain adequate forage for elk to support WGFD herd objectives.					
SD: 15.2 Maintain or enhance habitat for elk.					
SD: 15.3 Road densities and locations will maintain scenic and wildlife values.					
SD: 15.4 Protect the historical integrity of Sparhawk Cabin.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7094	SD: 15	The ACEC is open to livestock grazing and managed to meet the goals and objectives for the ACEC.			
7095	SD: 15	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7096	SD: 15	Designate BLM-administered lands in the Green Mountain area as a 14,612-acre ACEC (Map 130).	Same as Alternative A, but expand the ACEC by 10,248 acres for a total of 24,860 acres (Map 131).	Do not designate BLM-administered lands in the Green Mountain area as an ACEC.	Same as Alternative A, but expand the ACEC by 6,777 acres for a total of 21,389 acres (Map 132).
7097	SD: 15	Mineral and realty actions in the ACEC are managed with Category 3 restrictions. Management of mineral and realty actions in those portions of the ACEC that are campgrounds and picnic sites is addressed in the Recreation section.	Mineral and realty actions in the expanded ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the former ACEC are managed with Category 1 restrictions. Management of mineral and realty actions in those portions of the ACEC that are campgrounds and picnic sites is addressed in the Recreation section.	Mineral and realty actions in the expanded ACEC are managed as follows: <ul style="list-style-type: none">● Open to oil and gas leasing subject to NSO stipulations● Closed to geophysical exploration● Closed to solid mineral leasing● Open with a Plan of Operations to locatable minerals● Closed to mineral material disposals● Excluded for major ROWs● Avoided for minor ROWs

7000 SPECIAL DESIGNATIONS (SD) – GREEN MOUNTAIN ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					The expanded ACEC area under Alternative B that is not designated as part of the ACEC (7,383 acres) is managed with the same prescriptions as the ACEC except that no Plan of Operations is required for locatable mineral disturbances less than 5 acres.
7098	SD: 15	Manage different parts of the ACEC as VRM Class II or III (Map 130).	Same as Alternative A.	Manage different parts of the former ACEC as VRM Class III or IV.	The ACEC will be managed as VRM Class II.
7099	SD: 15	The forested areas are available for commercial timber sales and managed to promote elk habitat.	Same as Alternative A.	Manage forested areas to improve their potential for salable timber.	Same as Alternative A.
7100	SD: 15	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is compatible with ACEC values.
7101	SD: 15	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the ACEC.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	Acquired lands in the former ACEC are open to livestock grazing.	Same as Alternative A.

Table 2.44. 7000 Special Designations (SD) – South Pass Historic Mining Area ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – SOUTH PASS HISTORIC MINING AREA ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 16 Manage the South Pass Historic Mining Area, including the historic sites of Miner’s Delight and South Pass City, with the following objectives: Objectives: SD: 16.1 Protect significant historic sites and the intact settings around them. SD: 16.2 Work cooperatively with the State of Wyoming and others to reduce the hazards from AML. SD: 16.3 Work cooperatively with the State of Wyoming and others to maintain and enhance the recreational use of the Area. Goal SD: 17 Maintain the ACEC to provide an opportunity to experience and reflect upon the wide variety of scenic, cultural, historic, and physiographic setting characteristics of the land. Goal SD: 18 Use of the ACEC will minimally affect adjacent natural and cultural environments and harmonize with the management objectives of land and resource uses which are or may be occurring on the lands through which the trail passes. Goal SD: 19 Preserve and protect the historical remains and historical settings of the Oregon, Mormon Pioneer, California, and Pony Express NHTs and their associated historic sites for public use and enjoyment. Goal SD: 20 Provide for the outdoor recreation needs of an expanding population and promote the preservation of public access and enjoyment of the open air, outdoor areas, and historic resources of the nation.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7102	SD: 16	Conform to local zoning ordinances that apply to the area around South Pass City.			
7103	SD: 16	The area is open to livestock grazing. Fence off historic sites that are adversely impacted by livestock grazing. Make forage associated with newly acquired lands available for livestock use.			
7104	SD: 16	Travel and road density in the ACEC are managed to support ACEC objectives. See the Comprehensive Trails and Travel Management section for specific management actions.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7105	SD: 16	Designate BLM-administered lands in the South Pass Historic Mining Area as a 12,576-acre ACEC (Map 130).	Same as Alternative A, but expand the ACEC by 10,863 acres for a total of 23,439 acres (Map 131).	Do not designate BLM-administered lands in the South Pass Historic Mining Area as an ACEC.	Designate the 124,229-acre South Pass Historical Landscape ACEC, which includes the 1987 South Pass Historic Mining Area ACEC (12,576 acres) (Map 132).

7000 SPECIAL DESIGNATIONS (SD) – SOUTH PASS HISTORIC MINING AREA ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7106	SD: 16	Manage different parts of the ACEC as VRM Class II to IV (Map 75).	Manage different parts of the ACEC as VRM Class II or III (Map 76).	Manage different parts of the former ACEC as VRM Class III or IV (Map 77).	Manage the South Pass Historical Landscape ACEC as VRM Class II (Map 78). On a case-by-case basis, remove or reclaim visually intrusive existing roads, facilities, and ROW not necessary to attain NHT or CDNST management objectives.
7107	SD: 16	Mineral and realty actions in the ACEC are managed with Category 3 restrictions. Withdraw a portion of the ACEC (1,727 acres around sites such as Miner's Delight and South Pass City) (Map 130) except for casual use.	Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the former ACEC are managed with Category 1 restrictions.	Mineral and realty actions, except for major ROWs, within the South Pass Historical Landscape ACEC are managed as follows: <ul style="list-style-type: none"> • Open to oil and gas leasing subject to NSO stipulations • Closed to geophysical exploration • Closed to solid mineral leasing • Open with a Plan of Operations unless otherwise withdrawn to locatable minerals • Closed to mineral material disposals • Excluded for major ROWs • Avoided for minor ROWs Portions of the South Pass Historical Landscape ACEC are within the Hudson to Atlantic City mineral withdrawal for the benefit of wildlife, viewsheds, and cultural resources. The ACEC is entirely within the NTMC (see the Congressionally Designated Trails section), which is avoided for major ROWs except in designated corridors. ACEC management excludes the South Pass Historical

7000 SPECIAL DESIGNATIONS (SD) – SOUTH PASS HISTORIC MINING AREA ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					Landscape ACEC for major ROWs.
7108	SD: 17, 18, 19	No similar action.	No similar action.	No similar action.	Highly visible projects and/or projects out of scale with the surrounding environment (such as large wind-energy development projects, gas plants, power plants, transmission lines, etc.) are subject to the following restriction: Projects of this type outside of 5 miles on each side of the NHTs (except within the main Lost Creek utility corridor) are authorized only if the project causes no more than a weak contrast, as defined in the BLM Visual Resource Manual.
7109	SD: 17, 18, 19	No similar action.	No similar action.	No similar action.	Range projects and mineral supplementation and their associated impacts within the new South Pass Historical Landscape ACEC: analyze projects on a case-by-case base and allow those that conform to the VRM Class for the area.
7110	SD: 17, 18, 19	No similar action.	No similar action.	No similar action.	0 to 5 miles on each side of NHTs: new audible and atmospheric effects will not exceed current levels existing along the NHT corridors.

7000 SPECIAL DESIGNATIONS (SD) – SOUTH PASS HISTORIC MINING AREA ACEC (EXISTING)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7111	SD: 16	When possible, implement fire and fuels management to reduce dangers from fire in the WUI.	Where appropriate in consideration of wildlife and visual resources, develop and implement fire and fuels management to reduce dangers from fire in the WUI.	Same as Alternative A.	Same as Alternative A.
7112	SD: 16	Develop a cultural resource management plan for the South Pass Historic Mining Area.	Develop a cultural resource protection and management plan for the South Pass Historic Mining Area, including stabilization, recreation, stewardship, and public education plans for Miner's Delight, Lemley Mill, and the BLM-administered portion of South Pass City.	No similar action.	Same as Alternative B.

Table 2.45. 7000 Special Designations (SD) – National Historic Trails ACEC (Existing)

7000 SPECIAL DESIGNATIONS (SD) – NATIONAL HISTORIC TRAILS ACEC (EXISTING)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goals and objectives for the National Historic Trails ACEC are contained in the Congressionally Designated Trails section.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
N/A	N/A	Note: Management actions for the National Historic Trails ACEC are provided in the Congressionally Designated Trails section.			

Table 2.46. 7000 Special Designations (SD) – Continental Divide National Scenic Trail ACEC (Proposed)

7000 SPECIAL DESIGNATIONS (SD) – CONTINENTAL DIVIDE NATIONAL SCENIC TRAIL ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goals and objectives for the Continental Divide National Scenic Trail ACEC are contained in the Congressionally Designated Trails section.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
N/A	N/A	Note: Management actions for the Continental Divide National Scenic Trail ACEC are provided in the Congressionally Designated Trails section.			

Table 2.47. 7000 Special Designations (SD) – Cedar Ridge ACEC (Proposed)

7000 SPECIAL DESIGNATIONS (SD) – CEDAR RIDGE ACEC (PROPOSED)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 21 Manage Cedar Ridge with the following objectives:					
Objectives:					
SD: 21.1 Protect and enhance the site’s traditional cultural importance.					
SD: 21.2 Prevent disturbance to the site.					
SD: 21.3 Protect and enhance access to the site.					
SD: 21.4 Protect archeologically significant properties such as stone alignments, cairns, effigies, and circles.					
SD: 21.5 Protect artifacts and evidence of prehistoric activity.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7113	SD: 21	Travel and road density in the area are managed to support ACEC objectives. (See 6000-Comprehensive Trails and Travel Management for specific management actions.)			
7114	SD: 21	The area is open to livestock grazing and managed to meet the goals and objectives for the cultural property.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7115	SD: 21	Manage Cedar Ridge to protect the area as a TCP subject to standard Protocol and NHPA measures. Manage visual effects to the Traditional Cultural Property on a case-by-case basis using standard Protocol and NHPA measures.	Designate BLM-administered lands in Cedar Ridge area as a 7,039-acre ACEC (Map 131).	Same as Alternative A.	Manage the Cedar Ridge TCP (255 acres) and its periphery (3,284 acres) to protect its cultural and sacred resources. Do not designate the TCP and periphery as an ACEC.
7116	SD: 21	Manage different parts of Cedar Ridge as VRM Class II to IV.	Manage the ACEC as VRM Class II.	Manage different parts of Cedar Ridge as VRM Class III or IV.	Manage the Cedar Ridge TCP as VRM Class II. Manage the periphery area as VRM Class III.

7000 SPECIAL DESIGNATIONS (SD) – CEDAR RIDGE ACEC (PROPOSED)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7117	SD: 21	Mineral and realty actions in the Cedar Ridge area are managed with Category 2 restrictions.	Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Mineral and realty actions in the Cedar Ridge area are managed with Category 1 restrictions.	<p>Mineral and realty actions in the TCP are managed as follows:</p> <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to NSO stipulations ● Closed to geophysical exploration ● Closed to solid minerals leasing ● Closed to pursue locatable mineral withdrawal ● Closed to mineral material disposal ● Excluded to major ROWs ● Avoided for minor ROWs <p>Mineral and realty actions in the periphery are managed as follows:</p> <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to CSU stipulations ● Open to geophysical exploration subject to CSU stipulations ● Open to solid minerals leasing for 5 acres or less, subject to limits on surface use comparable the CSU for oil and gas. ● Open to mineral material disposals subject to CSU stipulations ● Avoided for major ROWs ● Open to minor ROWs subject to CSU stipulations

7000 SPECIAL DESIGNATIONS (SD) – CEDAR RIDGE ACEC (PROPOSED)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7118	SD: 21	Range improvement projects are authorized on a case-by-case basis.	Range improvement projects are prohibited.	Authorize range improvement projects.	Do not authorize new range improvement projects or mineral supplementation in the TCP. The periphery is open to range improvements and mineral supplementation subject to a CSU stipulation.
7119	SD: 21	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the Cedar Ridge area.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not considered for livestock use.	Same as Alternative A.	Same as Alternative A.
7120	SD: 21	On a case-by-case basis, manage to protect archeological values but do not develop a management and protection plan or site stewardship plan.	Complete an archeological inventory of the ACEC and develop a management and protection plan (including a site stewardship plan) for the ACEC.	Same as Alternative A.	In conjunction with the Casper Field Office, develop a management and protection plan (including a site stewardship plan) for the TCP and periphery.

Table 2.48. 7000 Special Designations (SD) – Castle Gardens ACEC (Proposed)

7000 SPECIAL DESIGNATIONS (SD) – CASTLE GARDENS ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 22 Manage Castle Gardens with the following objectives:					
Objectives:					
SD: 22.1 Establish appropriate management prescriptions to improve the integrity of this site. Utilize public and tribal input to redesign the constructed facilities to enhance the visitor’s experience. Utilize scientific expertise to repair damage to, reduce vandalism upon, and better preserve the prehistoric rock art.					
SD: 22.2 Decrease vandalism, cross-country use, and erosion through better interpretation, removal of existing graffiti where possible, and redesign of constructed facilities.					
SD: 22.3 Make recreation use compatible with cultural and scientific values. Redesign the constructed facilities to reduce erosion and damage to soils, vegetation, and buried cultural resources.					
SD: 22.4 Coordinate with recreation and other programs to improve interpretation of the site’s rock art (i.e., low profile informational signs at selected locations within the site, incorporating new scientific information about the site); improve public enjoyment and appreciation of the site (i.e., improved barriers, viewing areas, and paths to the rock art panels).					
SD: 22.5 Provide opportunities for appropriate scientific research at the site.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7121	SD: 22	Travel and road density in the area are managed to support ACEC objectives. (See 6000-Comprehensive Trails and Travel Management for specific management actions.)			
7122	SD: 22	The 78 acre immediate site area is closed to livestock grazing and managed to meet the goals and objectives for the cultural property.			
MANAGEMENT ACTIONS BY ALTERNATIVES					
7123	SD: 22	Manage BLM-administered lands immediately around the Castle Gardens site as a cultural/recreational site (78 acres).	Designate BLM-administered lands within a 3-mile radius around the Castle Gardens site as an 8,469-acre ACEC (Map 131).	Same as Alternative A.	Same as Alternative A, plus manage approximately 1,656 acres around the periphery of the site to support cultural values (see Map 132). (The periphery area includes the 3 BLM sections to the northwest, northeast, and southeast of Castle Gardens minus any private lands in these sections). Do not designate the Castle Garden area or periphery as an ACEC.

7000 SPECIAL DESIGNATIONS (SD) – CASTLE GARDENS ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7124	SD: 22	Manage different parts of the area as VRM Class II to IV.	Manage different parts of the ACEC as VRM Class II or III.	Manage the cultural/recreational site as a VRM Class III, but manage the lands around it as VRM Class IV.	Manage the Castle Gardens site and periphery as VRM Class II.
7125	SD: 22	Mineral and realty actions in the 78-acre area are managed with Category 5 restrictions, and outside the 78 acres are managed with Category 1 restrictions.	Mineral and realty actions in the 78-acre area are managed with Category 5 restrictions. Mineral and realty actions in the remainder of the ACEC (8,391 acres) are managed with Category 4 restrictions.	Same as Alternative A.	<p>Mineral and realty actions in the 78-acre area are managed with the following restrictions:</p> <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to NSO stipulations ● Closed to geophysical exploration ● Closed to solid mineral leasing ● Withdrawn from locatable mineral entry in pre-FLPMA action ● Closed to mineral material disposal ● Excluded to major ROWs ● Excluded for minor ROWs <p>Mineral and realty actions in the periphery area are managed with the following restrictions:</p> <ul style="list-style-type: none"> ● Open to oil and gas leasing subject to NSO stipulations ● Open to geophysical exploration ● Closed to solid mineral leasing ● Closed to mineral material disposal ● Excluded to major ROWs ● Avoided for minor ROWs

7000 SPECIAL DESIGNATIONS (SD) – CASTLE GARDENS ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7126	SD: 22	Manage the area to facilitate recreational use while protecting resource values.	Develop and implement a new protection and management plan, including redesigning the site stewardship program and continuing the research program. Modify access to the ACEC and manage recreational use to limit damage to the rock art and sacred sites. Remove improved recreational facilities, such as the picnic area, in the 78-acre area. Limit road access to outside of the 78-acre core.	Same as Alternative A.	Develop and implement a new protection and management plan, including redesigning the site, implementing a stewardship program, and continuing the research program.
7127	SD: 22	Range improvement projects in the periphery area are constructed on a case-by-case basis.	Do not allow new range improvement projects, including mineral supplementation and their associated impacts, within the boundaries of the Castle Gardens ACEC.	Same as Alternative A.	Construct range improvement projects in the periphery only when compatible with the area's cultural values.
7128	SD: 22	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the area.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not considered for livestock use.	Same as Alternative A.	Same as Alternative A.

Table 2.49. 7000 Special Designations (SD) – Sweetwater Rocks ACEC (Proposed)

7000 SPECIAL DESIGNATIONS (SD) – SWEETWATER ROCKS ACEC (PROPOSED)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 23 Manage the Sweetwater Rocks with the following objectives: Objectives: SD: 23.1 Maintain the views of the Sweetwater Rocks from Wyoming State Highway 220 and U.S. Highway 287 and the viewshed looking out from the Rocks. SD: 23.2 Route densities and locations will maintain or enhance the scenic and wilderness characteristics. SD: 23.3 The areas within the Sweetwater Rocks WSAs are managed in accordance with BLM Manual 6330, <i>Management of Wilderness Study Areas</i> .					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7129	SD: 23	Visual resource, livestock grazing, mineral, realty and travel management actions for the WSA portions of the proposed ACEC are found in the WSA section.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7130	SD: 23	Do not designate the Sweetwater Rocks area as an ACEC.	Designate BLM-administered lands in the Sweetwater Rocks area as a 152,347 acre ACEC (Map 131).	Same as Alternative A.	Same as Alternative A.
7131	SD: 23	Manage the areas outside of the WSA as VRM Class II to IV.	Manage the areas outside of the WSAs as VRM Class II to III.	Manage the areas outside of the WSAs as VRM Class II to IV.	Manage the area outside of the WSAs as VRM Class II except that portion that is within the Lost Creek ROW corridor which is managed as Class III.
7132	SD: 23	Mineral and realty actions in the area outside of the WSAs are managed with Category 1 restrictions.	Mineral and realty actions in the ACEC are managed with Category 6 restrictions.	Same as Alternative A.	Mineral and realty actions in the area outside of the WSAs (118,165 acres) are managed with the following restrictions: <ul style="list-style-type: none">● Open to oil and gas leasing subject to CSU stipulations● Open to geophysical exploration● Open to solid mineral leasing● Closed to mineral material disposal except for preexisting sales and free use permits.● Open to major ROWs

7000 SPECIAL DESIGNATIONS (SD) – SWEETWATER ROCKS ACEC (PROPOSED)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
					<ul style="list-style-type: none"> • Open to minor ROWs
7133	SD: 23	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in Sweetwater Rocks.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not considered for livestock use.	Same as Alternative A.	Same as Alternative A.

Table 2.50. 7000 Special Designations (SD) – Regional Historic Trails and Early Highways ACEC (Proposed)

7000 SPECIAL DESIGNATIONS (SD) – REGIONAL HISTORIC TRAILS AND EARLY HIGHWAYS ACEC (PROPOSED) (RHT&EHs)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 24 Manage the RHT&EHs with the following objectives:					
Objectives:					
SD: 24.1 Maintain and enhance the significant qualities of RHT&EH segments and sites. Avoid adverse effects, as defined in the NHPA and the BLM/SHPO Wyoming State Protocol, upon intact RHT&EH segments, their settings, and associated sites.					
SD: 24.2 Protect remnants, ruts, traces, graves, campsites, landmarks, artifacts, and other remains associated with the RHT&EHs.					
The following are RHT&EHs determined Eligible for the NRHP:					
<ul style="list-style-type: none">• Bridger Trail• Casper to Lander Road• Rawlins-Fort Washakie Stage Trail• Green River to South Pass to Fort Washakie Stage Trail• Birdseye Pass Stage Trail• Point of Rocks to South Pass Stage Trail• Yellowstone/National Park to Park Highway					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7134	SD: 24	Pursuant to Section 106 of the National Historic Preservation Act of 1966 as amended, the National Programmatic Agreement and the Wyoming State Protocol, case-by-case reviews for specific undertakings require analysis and assessments of effects. Such analysis and assessment may reveal the need for additional restrictions beyond those specifically described in the RMP.			
7135	SD: 24	RHT&EHs and acquired lands added to RHT&EHs are open to livestock grazing.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7136	SD: 24	Do not designate the RHT&EH as an ACEC. Manage RHT&EHs on a case-by-case basis in consideration of resource values and in accordance with the NHPA (Map 79).	Designate BLM-administered lands within ½ mile on each side of intact segments of each RHT&EH as a 89,016-acre ACEC (Map 131).	Same as Alternative A.	Same as Alternative A.

7000 SPECIAL DESIGNATIONS (SD) – REGIONAL HISTORIC TRAILS AND EARLY HIGHWAYS ACEC (PROPOSED) (RHT&EHs)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7137	SD: 24	<p>Mineral and realty actions are subject to the following restrictions (Map 79):</p> <ul style="list-style-type: none"> • Within ¼ mile on each side of designated portions of the RHT&EHs or the visible horizon, whichever is closer, are managed with Category 2 restrictions. • The area beyond ¼ mile from the RHT&EHs is managed with Category 1 restrictions and NHPA measures to minimize the effects to these RHT&EHs. 	<p>Mineral and realty actions, except for highly visible projects (e.g., wind farms, gas plants, and power plants), are subject to the following restrictions (Map 80):</p> <ul style="list-style-type: none"> • Within ½ mile on each side of intact segments of the RHT&EHs is managed with Category 5 restrictions. • ½ to 2 miles on each side of intact segments of the RHT&EHs are managed with Category 4 restrictions unless the proposed project and its associated impacts are not visible from the RHT&EHs. • 2 to 5 miles on each side of intact segments of the RHT&EHs are managed with Category 2 restrictions unless the proposed project and its associated impacts are not visible from the RHT&EHs. • Outside of 5 miles on each side of the RHT&EHs are managed with Category 1 restrictions. 	<p>Mineral and realty actions along the RHT&EHs are managed with Category 1 restrictions.</p>	<p>Inside of DDAs, maintain and develop MOAs for RHT&EH management within DDAs. Where MOAs are not developed mineral and realty actions are managed with standard Protocol and NHPA measures and (Map 79):</p> <ul style="list-style-type: none"> • Open to oil and gas leasing subject to CSU stipulations • Open to geophysical exploration • Open to solid mineral leasing • Open to mineral material disposal subject to CSU stipulations • Open to major ROWs • Open to minor ROWs <p>Outside of DDAs, protect the foreground of Historic Trails (defined in Glossary) up to 2 miles where setting is an important aspect of the integrity for the trail, and use Best Management Practices (Appendix H (p. 1521)) to avoid or mitigate adverse effects. Pursue site-specific protection plans or MOAs for RHT&EH management.</p>

7000 SPECIAL DESIGNATIONS (SD) – REGIONAL HISTORIC TRAILS AND EARLY HIGHWAYS ACEC (PROPOSED) (RHT&EHs)					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7138	SD: 24	Highly visible projects and/or projects out of scale with surrounding environment (e.g., wind farms, gas plants, and power plants) are managed with Category 2 restrictions from 0 to 5 miles on each side of intact segments of the RHT&EHs unless the proposed project and its associated impacts are not visible from the RHT&EHs.	Highly visible projects and/or projects out of scale with surrounding environment (e.g., wind farms, gas plants, and power plants) are managed with Category 5 restrictions from 0 to 5 miles on each side of intact segments of the RHT&EHs unless the proposed project and its associated impacts are not visible from the RHT&EHs. Areas outside of 5 miles on each side of the RHT&EHs are managed with Category 1 restrictions.	Highly visible projects and/or projects out of scale with surrounding environment (e.g., wind farms, gas plants, and power plants) are managed with Category 1 restrictions from 0 to 5 miles on each side of intact segments of the RHT&EHs unless the proposed project and its associated impacts are not visible from the RHT&EHs.	Highly visible projects and/or projects out of scale with surrounding environment (e.g., wind farms, gas plants, and power plants) are managed on a case-by-case basis.
7139	SD: 24	Do not authorize commercial motorized travel or ROWs on non-historic existing roads and trails.	Limit motorized and mechanized travel to designated roads and trails.	Limit motorized travel to existing roads and trails.	Same as Alternative A.
7140	SD: 24	Range improvement projects and mineral supplementation and their associated impacts are subject to the following restrictions (Map 79): <ul style="list-style-type: none"> ● Avoid within ¼ mile on each side of designated portions of the RHT&EHs or the visible horizon, whichever is closer. ● The area beyond ¼ mile from the RHT&EHs is open subject to Standard Protocol and NHPA measures to minimize the effects to the RHT&EHs. 	Range improvement projects and mineral supplementation and their associated impacts are subject to the following restrictions (Map 80): <ul style="list-style-type: none"> ● Do not authorize within 2 miles on each side of the RHT&EHs unless these actions and their associated impacts are not visible from the RHT&EHs. ● Authorize from 2 to 5 miles on each side of the RHT&EHs only if these actions and their associated impacts cause no more than a weak contrast, as defined in the BLM Visual Resource Manual. 	Same as Alternative A.	Range projects (including mineral supplementation) and their associated impacts are subject to the following restrictions within ½ mile of the trail (Map 79): <ul style="list-style-type: none"> ● Projects and their associated impacts are considered on a case-by-case basis to ensure that they are either hidden from the trails, are too far away to be seen, or are designed or camouflaged to cause no more than a weak contrast, as defined in the BLM Visual Resource Manual.

Table 2.51. 7000 Special Designations (SD) – Government Draw/Upper Sweetwater Sage-Grouse ACEC (Proposed)

7000 SPECIAL DESIGNATIONS (SD) – GOVERNMENT DRAW/UPPER SWEETWATER SAGE-GROUSE ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
Goal SD: 25 Manage the Government Draw/Upper Sweetwater Sage-Grouse area with the following objectives:					
Objectives:					
SD: 25.1 Maintain and improve forage and cover for greater sage-grouse.					
SD: 25.2 Maintain and improve leks, brood-rearing, and winter habitats for greater sage-grouse.					
SD: 25.3 Protect water sources for greater sage-grouse.					
SD: 25.4 Consider greater sage-grouse needs and protections in permitting activities on BLM-administered land.					
SD: 25.5 Route densities and locations will maintain or enhance greater sage-grouse habitat.					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
7141	SD: 25	VRM prescriptions are contained in the Visual Resources section.			
7142	SD: 25	Travel management for the area is in the Comprehensive Trails and Travel Management section.			
7143	SD: 25	The area is open to livestock grazing.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
7144	SD: 25	Do not designate the Government Draw/Upper Sweetwater Sage-Grouse area as an ACEC.	Designate BLM-administered lands in the Government Draw/Upper Sweetwater Sage-Grouse area as an ACEC (1,246,791 acres) (Map 131).	Same as Alternative A.	Designate 35,102 acres in the Hudson to Atlantic City area as the Twin Creek ACEC (Map 132).

7000 SPECIAL DESIGNATIONS (SD) – GOVERNMENT DRAW/UPPER SWEETWATER SAGE-GROUSE ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7145	SD: 25	Mineral and realty actions in the area are managed with Category 1 restrictions.	Mineral and realty actions in the ACEC are managed with Category 6 restrictions. Do not re-offer for lease expired existing oil and gas leases, except as necessary to provide drainage protection.	Mineral and realty actions in the area are managed with Category 1 restrictions.	Mineral and realty actions on 306,360 acres of land in the Hudson to Atlantic City area (including the Twin Creek ACEC) are managed as follows to protect multiple resource values: <ul style="list-style-type: none"> • Open to oil and gas leasing subject to NSO stipulations • Closed to geophysical exploration • Closed to solid mineral leasing • Withdrawn from locatable mineral entry. Conduct validity exams as staffing allows. Evaluate opportunities, including working with partners to buy out valid claims beneficial to resource values. Encourage buy-out of valid claims for offsite mitigation of surface disturbance in important wildlife habitat, including Core Area. • Closed to new mineral material disposals • Avoided for major ROWs except for designated corridors • Avoided for minor ROWs
7146	SD: 25	No similar action.	Actively pursue opportunities to reclaim existing roads and trails and ROWs not necessary to attain management objectives in order to protect greater sage-grouse and their habitat.	Same as Alternative A.	Same as Alternative B, except as opportunities arise. (See the Recreation section for motorized travel in Johnny Behind the Rocks.)

7000 SPECIAL DESIGNATIONS (SD) – GOVERNMENT DRAW/UPPER SWEETWATER SAGE-GROUSE ACEC (PROPOSED)					
Record #	Goal/ Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
7147	SD: 25	The area is open to livestock grazing.	The area is open to livestock grazing and managed to maintain or enhance greater sage-grouse habitat. (See the Vegetation and Grazing sections for additional management for greater sage-grouse habitat objectives.)	Same as Alternative A.	Same as Alternative B.
7148	SD: 25	Range improvement projects are constructed on a case-by-case basis.	Range improvement projects are prohibited.	Allow range improvement projects.	Construct range improvement projects when the purpose is compatible with Area values.
7149	SD: 25	Consider greater sage-grouse habitat when authorizing vegetation treatments.	Limit vegetation treatments to those that improve and enhance sagebrush steppe habitat.	Same as Alternative A.	Same as Alternative B, plus only allow vegetation treatments if they will maintain or enhance greater sage-grouse habitat. See additional management actions in the Fire and Fuels Management section.
7150	SD: 25	On a case-by-case basis, determine management prescriptions, including livestock grazing management, of acquired lands in the area.	Manage any lands acquired and added to the ACEC in accordance with the ACEC management prescriptions. Forage associated with newly acquired lands is not available for livestock use.	Same as Alternative A.	Same of Alternative A.

Table 2.52. 8000 Socioeconomic Resources (SR) and Health and Safety

8000 SOCIOECONOMIC RESOURCES (SR) and HEALTH AND SAFETY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
<p>Goal SR: 1 Provide sustainable economic development opportunities for a diversity of resources including energy, grazing and other agricultural activities, recreation, wildlife, fisheries, tourism, and others.</p> <p>Objective:</p> <p>SR: 1.1 Provide resources and necessary access, consistent with multiple and sustainable use, for economic, cultural, and social viability at the national, regional, and local levels.</p> <p>Goal SR: 2 Consider local and regional economic development and land use plans in BLM decision making. Provide opportunities for economic and social sustainability at the national, regional and local level.</p> <p>Objective:</p> <p>SR: 2.1 Consider the impact of BLM management actions on community health, welfare, infrastructure, services, housing, employment, custom, and culture.</p> <p>Goal SR: 3 Respect, recognize, and support public health and safety needs.</p> <p>Objectives:</p> <p>SR: 3.1 Reduce potential threats to public health and safety on BLM-administered lands.</p> <p>SR: 3.2 On a case-by-case basis, permit commercial use of BLM-administered lands with a requirement to submit a safety plan prior to use of the area.</p> <p>SR: 3.3 Reduce or minimize risk to humans and the environment from hazardous materials on BLM-administered lands in the planning area where possible.</p> <p>Goal SR: 4 Reduce risk to health and safety from geologic hazards on BLM-administered lands within the planning area.</p> <p>Objectives:</p> <p>SR: 4.1 Avoid geologic hazards on BLM-administered lands within the planning area, where possible.</p> <p>SR: 4.2 Inventory, assess, and manage geologic hazards on BLM-administered lands within the planning area.</p> <p>SR: 4.3 Reduce or eliminate hazards from abandoned mines on BLM-administered lands within the planning area, where possible.</p>					
MANAGEMENT ACTIONS COMMON TO ALL ALTERNATIVES					
8001	SR: 2	Consider local county and community plans regarding socioeconomic conditions during the decision making process.			

8000 SOCIOECONOMIC RESOURCES (SR) and HEALTH AND SAFETY					
Record #	Goal/Obj.	Alternative A	Alternative B	Alternative C	Alternative D
		(Current Management)	(Most Resource Conservation)	(Most Resource Utilization)	(Proposed RMP)
8002	SR: 3	Manage hazardous materials to reduce health and safety risks to the public, to restore contaminated lands, and to carry out emergency response activities, per appropriate laws, policies, and regulations.			
8003	SR: 3	In emergency situations, protect the health and safety of the public first and stabilize the situation with regard to the BLM's responsibilities and decision-making authority second.			
8004	SR: 2.1	Use partners to effectively leverage funding and facilitate AML projects. Prioritize AML projects with greater weight given to national evaluation criteria than to risk-based criteria.			
8005	SR: 4.3	Cooperate with the State of Wyoming on its AML program.			
8006	SR: 4.3	Identify locations of AML projects in the planning area and erect warning fencing and signing as funding allows.			
8007	SR: 3.1, 3.3, 4.2, 4.3	Reclaim AML to productive uses including, but not limited to, grazing, recreation, fish and wildlife habitat, and preservation of historical/cultural resources. Monitor success of AML reclamation projects and maintain reclamation and shaft/adit closures where needed.			
8008	SR: 3.3	Bond amounts for uranium and other surface-disturbing and disruptive activities will be adequate to ensure reclamation of project areas to prevent any potential impacts to the health and safety of the public.			
8009	SR: 3.2	Require that all new major ROWs, pipelines, and trenches across roads be closed as soon as possible to reduce hazards to the public, livestock, and wildlife after initial surface disturbance.			
8010	SR: 3.2	Require pipeline gates with soft plugs every ¼ mile along an open trench.			
8011	SR: 3.1, 3.2	Prohibit channel-disturbing activities on Rock Creek and Willow Creek in the Upper Sweetwater river drainage to avoid the mobilization of mercury.			
8012	SR: 3.1, 3.2	Comply with Onshore Oil and Gas Order #6 (43 CFR 3160) for drilling operations conducted in areas which are known or could reasonably be expected to contain H ₂ S.			
MANAGEMENT ACTIONS BY ALTERNATIVE					
8013	SR: 2.1	Analyze impacts on socioeconomic resources from the implementation of projects in the planning through the NEPA process.	Minimize adverse socioeconomic impacts associated with permitted actions such as boom and bust economies, and adverse impacts to community infrastructure. Encourage a balanced approach to economic diversity and enhance the local economy by providing opportunities for grazing, the development of recreational opportunities (e.g., fishing, hunting, and wildlife viewing), and renewable energy.	Same as Alternative A.	Same as Alternative A.

8000 SOCIOECONOMIC RESOURCES (SR) and HEALTH AND SAFETY					
Record #	Goal/Obj.	Alternative A (Current Management)	Alternative B (Most Resource Conservation)	Alternative C (Most Resource Utilization)	Alternative D (Proposed RMP)
8014	SR: 2.1	No similar action.	Consider paced development options for mineral and energy development projects in the planning area to avoid adverse impacts to socioeconomic conditions.	Minimize constraints on the pace of development for large development projects.	Same as Alternative B.
8015	SR: 3.1, 4.1	Consider landslide potential when authorizing activities.	Avoid construction activities on unstable soils, landslide deposits, and in subsidence areas.	Allow BLM-authorized construction activities within areas of known landslide hazard.	Same as Alternative A.

<p>ACEC Area of Critical Environmental Concern AML Abandoned Mine Lands AMP Allotment Management Plan APHIS Animal and Plant Health Inspection Service AQD Air Quality Division AQRV Air Quality Related Values ARPA Archeological Resources Protection Act AUM Animal Unit Month BLM Bureau of Land Management BMP Best Management Practice CDC Continental Divide-Creston CDNST Continental Divide National Scenic Trail CFR Code of Federal Regulations CSU Controlled Surface Use CWA Clean Water Act dBA Decibels with an A-weighted scale DDA Designated Development Area DEQ Department of Environmental Quality DOE Department of Energy EA Environmental Assessment EIS Environmental Impact Statement ERMA Extensive Recreation Management Area ESA Endangered Species Act FLPMA Federal Land Policy and Management Act FR Federal Register FRCC Fire Regime Condition Class GIS Geographic Information System H₂S Hydrogen Sulfide</p>	<p>HMA Herd Management Area HMAP Herd Management Area Plan IM Instruction Memorandum INNS Invasive Nonnative Species LRP Limited Reclamation Potential MLP Master Leasing Plan MMBF Million Board Feet MOA Memorandum of Agreement MOU Memorandum of Understanding N/A Not Applicable NEPA National Environmental Policy Act NHL National Historic Landmark NHPA National Historic Preservation Act NHT National Historic Trail NLCS National Landscape Conservation System >NNL National Natural Landmark NRCS Natural Resources Conservation Service NRHP National Register of Historic Places NSO No Surface Occupancy NTMC National Trails Management Corridor NWSRS National Wild and Scenic River System OHV Off-Highway Vehicle PEIS Programmatic Environmental Impact Statement PFC Proper Functioning Condition PFYC Potential Fossil Yield Classification PSD Prevention of Significant Deterioration R&PP Recreation and Public Purposes</p>	<p>REA Recreation Enhancement Act RMP Resource Management Plan RMZ Recreation Management Zone ROD Record of Decision ROW Right-Of-Way RHT&EH Regional Historic Trails and Early Highways SHPO State Historic Preservation Office SRMA Special Recreation Management Area SRP Special Recreation Permit TCP Traditional Cultural Property TLS Timing Limitation Stipulation TMDL Total Maximum Daily Load USDA United States Department of Agriculture USFS United States Forest Service USFWS United States Fish and Wildlife Service VRM Visual Resource Management WAFWA Western Association of Fish and Wildlife Agencies WGFD Wyoming Game and Fish Department WHMA Wildlife Habitat Management Area WSA Wilderness Study Area WSR Wild and Scenic River WUI Wildland-Urban Interface WYPDES Wyoming Pollutant Discharge Elimination System</p>
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2.11. Summary of Environmental Consequences by Alternative

Table 2.53, “Summary of Environmental Consequences by Alternative” (p. 253) summarizes potential impacts under alternatives A through D. Where appropriate, the table quantifies potential impacts anticipated from BLM-authorized actions. Table 2.53, “Summary of Environmental Consequences by Alternative” (p. 253) summarizes impacts under the four alternatives in acres (e.g., more acreage implies more impact, either beneficial or adverse) or qualitative descriptions comparing the impact potential among the alternatives (e.g., highest potential, lowest potential, or moderate potential) with brief descriptions of the qualifying rationale. The Summary of Impacts section for each resource in Chapter 4 provides a more detailed comparison of impacts between alternatives. Chapter 4 describes cumulative impacts from non-BLM actions; Table 2.53, “Summary of Environmental Consequences by Alternative” (p. 253) does not include cumulative impacts.

The environmental consequences of alternatives are not anticipated to exceed known legal thresholds or standards over the life of this RMP. Standard practices, BMPs, and guidelines for surface-disturbing activities are built into each alternative to avoid and minimize potential impacts. The BLM would consider mitigation of residual impacts during subsequent implementation-level projects and any associated environmental analyses performed at that time. All alternatives include reclamation of surface disturbance to reduce long-term impacts.

Table 2.53. Summary of Environmental Consequences by Alternative

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Air Quality				
NAAQS	Not anticipated to exceed.	Not anticipated to exceed.	Not anticipated to exceed.	Not anticipated to exceed.
WAAQS	Not anticipated to exceed.	Not anticipated to exceed.	Not anticipated to exceed.	Not anticipated to exceed.
Visibility Impacts	Moderate Potential. Moderate amount of projected VOC and particulate matter emissions.	Lowest Potential. Least amount of projected VOC and particulate matter emissions.	Highest Potential. Greatest amount of projected VOC and particulate matter emissions.	Moderate Potential. Moderate amount of projected VOC and particulate matter emissions.
Projected Greenhouse Gas Emissions	1.17 million metric tons of CO ₂ equivalents for 2018.	0.81 million metric tons of CO ₂ equivalents for 2018.	1.19 metric tons of CO ₂ equivalents for 2018.	1.11 metric tons of CO ₂ equivalents for 2018.
Soil and Water				
Acres of Surface Disturbance Anticipated from BLM Actions	52,591 short-term/ 12,439 long-term	74,689 short-term/ 7,502 long-term	160,065 short-term/ 60,631 long-term	53,894 short-term/ 11,453 long-term
Impacts from Long-term Erosion	Moderate Potential. 2,777,334 acres available for locatable mineral entry. Soil-disturbing activities allowed in areas with LRP with mitigation on a project-by-project basis.	Lowest Potential. 1,167,862 acres available for locatable mineral entry. Soil-disturbing and disruptive activities prohibited in areas with LRP.	Highest Potential. 2,800,467 acres available for locatable mineral entry. Soil-disturbing activities allowed in areas with LRP with mitigation on a project-by-project basis.	Moderate Potential. 2,351,399 acres available for locatable mineral entry. Soil-disturbing activities allowed in areas with LRP with mitigation on a project-by-project basis.
Groundwater Impacts	Moderate Potential. Mineral and realty actions in groundwater recharge areas are subject to standard stipulations. 2,274 new federal oil and gas and CBNG wells are projected.	Lowest Potential. Mineral and realty actions in areas underlain by a sole source aquifer are managed with moderate restrictions. 1,528 new federal oil and gas and CBNG wells are projected.	Highest Potential. Mineral and realty actions in groundwater recharge areas are managed with standard stipulations. 2,284 new federal oil and gas and CBNG wells are projected.	Lowest Potential. Mineral and realty actions in areas underlain by a sole source aquifer are managed with moderate restrictions. 2,125 new federal oil and gas and CBNG wells are projected.
Potential for Produced Water To Impact Soils	Moderate Potential. Impacts to soils are considered on a case-by-case basis when managing produced water. This alternative is projected to result in the second-most new federal oil and gas and CBNG wells.	Lowest Potential. Impacts to soils are considered on a case-by-case basis when managing produced water. This alternative is projected to result in the least new federal oil and gas and CBNG wells. Surface discharge of produced water in all new oil and gas development projects is avoided.	Highest Potential. Impacts to soils are considered on a case-by-case basis when managing produced water. This alternative is projected to result in the most new federal oil and gas and CBNG wells.	Moderate Potential. Impacts to soils are considered in coordination with the State of Wyoming. This alternative is projected to result in the second-least new federal oil and gas and CBNG wells.
Exceed Water Quality Standards	Not anticipated.	Not anticipated.	Not anticipated.	Not anticipated.

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Lands with Wilderness Characteristics				
Potential to Impact Lands with Wilderness Characteristics	Moderate Potential. No management actions are prescribed to enhance wilderness character of the Little Red Creek Complex. Resource uses are limited in this area by ACEC management.	Lowest Potential. The Little Red Creek Complex (5,490 acres) is managed as non-WSA land with wilderness characteristics to protect wilderness values.	Highest Potential. No management actions are prescribed to enhance wilderness character of the Little Red Creek Complex. ACEC and travel management designations are removed from the area.	Lowest Potential. 4,954 acres of the Little Red Creek Complex are managed as non-WSA land with wilderness characteristics to protect wilderness values. 536 fewer acres are managed to protect wilderness values compared to Alternative B.
Minerals				
Acres Proposed for Withdrawal with High Potential for Locatable Minerals	0	278,906	0	0
Percent of Federal Mineral Estate Pursued for Withdrawal from Locatable Mineral Entry	<1%	58.1%	<1%	16%
Percent of Federal Mineral Estate Closed to Oil and Gas Leasing	<1%	81%	<1%	4%
Percent of Federal Mineral Estate Closed to Mineral Material Disposals	11.2%	92.5%	6.7%	34%
Total Projected New Federal Oil and Gas and CBNG Wells	2,274	1,528	2,284	2,125
Acres of BLM-administered Mineral Estate with Phosphate Potential Closed to Leasing	10,047	39,592	1,721	42,164
Fire and Fuels Management				
Acres of Short-term Surface Disturbance from Prescribed Fire	6,000	20,000	6,000	10,000

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Acres of Short-term Surface Disturbance from Mechanical Fuels Treatment	10,000	30,000	10,000	10,000
Potential for Fire Suppression Strategies To Limit Landscape-level Wildfires outside of greater sage-grouse Core Area	Moderate Potential. Full suppression of wildland fire used on a case-by-case basis.	Lowest Potential. Full suppression of wildland fire used only within the WUI, and other areas of critical resource values, with other suppression strategies used on a case-by-case basis, with emphasis in sagebrush areas including unplanned ignition to achieve resource benefit.	Highest Potential. Full suppression of wildland fire is the most likely response throughout the planning area.	Moderate Potential. Full suite of suppression tactics used across the planning area, with opportunities for use of wildland fire and full suppression tactics used on a case-by-case basis with emphasis in sagebrush areas.
Vegetation				
Acres of Projected Short-term Surface Disturbance Per Year from Forest and Woodland Management to Provide Forest Products and Improve Forest Health	375. (Overall forest health is balanced with sustainably providing commercial forest products.)	550. (Natural processes are emphasized to achieve forest health objectives.)	550. (All available tools and silvicultural techniques are allowed to provide forest products and maintain forest health.)	600. (All available tools and silvicultural techniques are allowed to provide forest products and maintain forest health.)
Potential to Fragment Vegetation Communities	Moderate Potential. 12,439 acres of long-term surface disturbance would affect vegetation communities.	Lowest Potential. 7,502 acres of long-term surface disturbance would affect vegetation communities.	Highest Potential. 60,631 acres of long-term surface disturbance would affect vegetation communities.	Moderate Potential. 11,453 acres of long-term surface disturbance would affect vegetation communities.
Potential Impact of Surface Disturbance on Riparian-Wetland Resources	Moderate Potential. Surface-disturbing activities are prohibited within 500 feet of surface water and riparian-wetland areas. Mineral and realty actions managed with moderate restrictions.	Lowest Potential. Surface-disturbing activities are prohibited within 1,320 feet of surface water, riparian-wetland areas, playas, and 100-year floodplains where mapped (except for areas of high and moderate oil and gas potential). Mineral and realty actions are managed with moderate restrictions.	Highest potential. Surface-disturbing activities are allowed on a case-by-case basis in riparian-wetland areas and floodplains.	Moderate Potential. Surface-disturbing activities are prohibited within 500 feet of surface water and riparian-wetland areas except in DDAs. More restrictions are applied to mineral and realty actions outside of DDAs. Implementation of Required Design Features to minimize surface disturbance and protect other resources.
Invasive Species and Pest Management				

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Potential To Spread Invasive and Nonnative Species.	Moderate Potential. 52,591 acres of total short-term surface disturbance contributes to the spread of INNS. Reclamation plans are required in LRP areas. 5,923 acres are closed to motorized travel. Livestock flushing is not required.	Lowest Potential. 74,689 acres of total surface disturbance contributes to the spread of INNS. Soil disturbing activities are prohibited in LRP areas. 71,761 acres are closed to motorized travel. The Authorized Officer may require livestock flushing for a period of 72 hours.	Highest Potential. 160,065 acres of total surface disturbance contributes to the spread of INNS. Reclamation plans are required in LRP areas. 5,472 acres are closed to motorized vehicle use. Livestock flushing is not required.	Moderate Potential. 53,894 acres of total surface disturbance contributes to the spread of INNS. Reclamation plans are required in LRP areas. 26,357 acres are closed to motorized travel. The Authorized Officer may require livestock flushing for a period of 72 hours. Use of Required Design Features will further reduce potential for INNS spread.
Fish and Wildlife				
Impacts to Water Quality and Fish Habitat	Moderate potential. 12,439 acres of long-term surface disturbance contributes to sedimentation and alters flow regimes. Surface-disturbing activities and placement of salt and mineral supplements are prohibited within 500 feet and ¼ mile of surface water, respectively. Forage utilization levels for livestock are established on a case-by-case basis.	Lowest Potential. 7,502 acres of long-term surface disturbance contributes to sedimentation and alters flow regimes. Surface-disturbing activities and placement of salt and mineral supplements are prohibited within 1,320 feet and ½ mile of surface water, respectively. Forage utilization established at 21-40% in livestock-preferred areas on a case-by-case basis.	Highest Potential. 60,631 acres of long-term surface disturbance contributes to sedimentation and alters flow regimes. Surface-disturbing activities and placement of salt and mineral supplements are prohibited on a site-specific basis near and within ¼ mile of surface water, respectively. Forage utilization established at 41-60% in livestock-preferred areas on a case-by-case basis.	Moderate Potential. 11,453 acres of long-term surface disturbance contributes to sedimentation and alters flow regimes. Surface-disturbing activities and placement of salt and mineral supplements are prohibited within 500 feet and ½ mile of surface water, respectively. Forage utilization levels established in livestock-preferred areas to achieve resource objectives. Indirect benefit from Required Design Features.
Acres of Elk and Bighorn Sheep Parturition Areas Closed to Mineral Leasing	237	23,055	0	7,942
Acres/Percent of Big Game Crucial Winter Range Managed as ROW Exclusion	102,461/ 16.9%	518,163/ 85.5%	58,270/ 9.6%	238,472/ 38.6%
Potential Impact of Motorized Vehicle Use on Wildlife	Moderate Potential. Motorized travel is limited to existing roads and trails in 93% of the planning area. 111,002 acres are closed seasonally.	Lowest Potential. Motorized travel is limited to existing roads and trails on 89% of the planning area. 116,805 acres are closed seasonally.	Highest Potential. Motorized travel is limited to existing roads and trails on 98% of the planning area. No areas are closed seasonally.	Moderate Potential. Motorized travel is limited to existing roads and trails on 92% of the planning area. 110,530 acres are closed seasonally.

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Special Status Species				
Adverse Impacts to Special Status Species within the Planning Area	Moderate Potential. In general, this alternative applies moderate restrictions to surface-disturbing activities that will destroy or degrade habitat. Second-most (2,274) projected new federal oil and gas and CBNG wells may fragment habitat.	Lowest Potential. In general, this alternative applies the most restrictions to surface-disturbing activities. Fewest (1,528) projected new federal oil and gas and CBNG wells would limit habitat fragmentation.	Highest Potential. In general, this alternative applies the least restrictions to surface-disturbing activities. Most (2,284) projected new federal oil and gas and CBNG wells may result in the most habitat fragmentation.	Moderate Potential. In general, this alternative applies moderate restrictions to surface-disturbing activities, but is more restrictive than Alternative A in important habitat, particularly Special Designation areas. Second-fewest (2,125) projected new federal oil and gas and CBNG wells would limit habitat fragmentation. Inclusion of Required Design Features to reduce adverse impacts.
Acres of Protective Buffer around Occupied Greater Sage-grouse Leks to Prohibit Surface-disturbing Activities	16,283	93,411	16,283	122,890
Acres of Greater Sage-grouse Core Area Open to Locatable Mineral Entry	1,720,190	458,112	1,720,542	1,358,699
Acres of Raptor Nesting Areas in Phosphate Potential Areas Open to Mineral Leasing	1,002	836	1,367	589
Potential for Density of Development to Affect Greater Sage-grouse Habitat	Highest Potential. The density of disturbances and cumulative acres of disturbance are not limited in identified breeding, nesting, and brood-rearing habitat.	Lowest Potential. In identified breeding, nesting, and brood-rearing habitat, the density of disturbances is limited to 1 per 640 acres and the cumulative surface disturbance is limited to 2.5% of the sagebrush habitat in the same 640 acres.	Highest Potential. The density of disturbances and cumulative acres of disturbance are not limited in identified breeding, nesting, and brood-rearing habitat.	Low Potential. In Core Area, the density of disturbances is limited to 1 per 640 acres and the cumulative surface disturbance is limited to 5% of the sagebrush habitat in the same 640 acres. Inclusion of Required Design Features.
Wild Horses				

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Potential To Impact the Free-roaming Nature of Wild Horses	Highest Potential. 125,098 acres in HMAs with high wind potential are open to wind-energy development. ROW development in HMAs is allowed on a case-by-case basis.	Lowest Potential. Wind-energy development is excluded in HMAs. Most area in HMAs is managed as ROW avoidance or exclusion.	Highest Potential. 125,098 acres in HMAs with high wind potential are open to wind-energy development. Least area in HMAs managed as ROW avoidance or exclusion.	Moderate Potential. 23,365 acres in HMAs with high wind potential are open to wind-energy development. Portions of HMAs managed as ROW avoidance or exclusion.
Heritage Resources				
Potential to Impact Eligible/Listed Cultural Sites and Paleontological Localities	Moderate Potential. Proactive management used to preserve known sites of importance. Recovery of scientific data or detailed documentation required for threatened significant cultural resources.	Lowest Potential. Avoidance of eligible/listed cultural sites and fossil localities is emphasized. This alternative contains the most extensive proactive management to better preserve the setting of cultural sites and spiritual/sacred/traditional sites. Important paleontological areas are closed to mineral leasing.	Highest Potential. Minimum restrictions required by regulation are imposed on activities that could cause adverse impacts to National Register-eligible properties. This alternative contains the least proactive management to preserve eligible/listed cultural sites and fossil localities.	Low Potential. Significant cultural resources are avoided whenever possible and scientific data recovery or detailed documentation is required if avoidance is not possible. This alternative contains more extensive proactive management to better preserve the setting of cultural sites and spiritual/sacred/traditional sites than Alternative A.
Visual Resources				
Acres Managed as VRM Class I-III	482,349	1,636,329	803,446	1,698,904
Inventory Class I/VRM Class I (percent of planning area) ¹	2.3%/ 2.4%	2.3%/ 2.5%	2.3%/ 2.3%	2.3%/ 2.5%
Inventory Class II/VRM Class II (percent of planning area) ¹	23.8%/ 8.5%	23.8%/ 53.6%	23.8%/ 1.1%	23.8%/ 32.6%
Inventory Class III/VRM Class III (percent of planning area) ¹	35.5%/ 9.3%	35.5%/ 12.2%	35.5%/ 30.2%	35.5%/ 35.8%
Inventory Class IV/VRM Class IV (percent of planning area) ¹	38.3%/ 77.4%	38.3%/ 31.6%	38.3%/ 66.4%	38.3%/ 29.0%
Potential To Impact Areas with Unique Scenic Features	Moderate Potential. Sensitive and unique scenic features managed to partially retain the existing character of the landscape, frequently allowing major modifications.	Lowest Potential. Sensitive and unique scenic features managed to retain the existing character of the landscape.	Highest Potential. Sensitive and unique scenic features managed to more frequently allow major modifications to the landscape.	Moderate Potential. Sensitive and unique scenic features managed to retain characteristics of the landscape, infrequently allowing major modifications.

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Renewable Energy				
Acres Open to Renewable Energy Development in Areas with High Wind Potential	283,647	867	321,870	9,998
Rights-of-Way and Corridors				
Potential To Limit the Development of ROWs	Low Potential. 66,099 acres avoidance 205,916 acres exclusion	Highest Potential. 315,219 acres avoidance 1,919,029 acres exclusion	Lowest Potential. 11,714 acres avoidance 147,053 acres exclusion	Moderate Potential. 1,369,300 acres avoidance 417,426 acres exclusion
Acres of Designated Right-of-Way Corridors	4,892	15,364	660,908	103,646
Comprehensive Trails and Travel Management				
Acres of Disturbance from New Roads and Trails Due to ROW Authorizations	231.8	36.36	237.93	115.5
Potential To Limit Over-snow Travel	Moderate Potential. 14,729 acres closed to over-snow travel.	Highest Potential. 181,173 acres closed to over-snow travel.	Lowest Potential. The entire planning area is open to over-snow travel.	Moderate Potential. 70,425 acres closed to over-snow travel.
Livestock Grazing				
Total Permitted AUMs ² Lost from Adjustments to Meet Rangeland Health Standards, Closures, and Surface-disturbing Activity	1,414	152,054	30,322	51,808
Total Actual AUMs ³ Lost from Adjustments to Meet Rangeland Health Standards, Closures, and Surface-disturbing Activity	1,031	82,672	22,135	37,820
Actual AUMs ³ Projected at the End of the Planning Cycle/Percent Reduction from Baseline (204,993)	203,962 <1%	122,321 40% AUMs under Alternative B are projected to be reduced over time in order to meet rangeland health standards without infrastructure.	182,858 11%	167,173 18%

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Potential To Limit New Range Improvement Projects	Moderate Potential. Range improvement projects are designed to meet allotment management objectives on a case-by-case basis.	Highest Potential. Range improvement projects are prohibited if they would cause adverse impacts to other resource values.	Lowest Potential. Range improvement projects are designed to maximize livestock forage and distribution.	Moderate Potential. Range improvement projects implemented as part of comprehensive grazing strategies to improve rangeland health.
Recreation				
Acres of Recreation Setting Trending Toward Primitive	5,923	71,761	5,472	26,357
Acres of Recreation Setting Maintained at Existing Condition	146,717	1,739,972	16,330	714,824
Acres of Recreation Setting Trending Toward Urban/Industrialized	2,241,570	582,477	2,372,408	1,653,961
Number/Total Acres of SRMAs	3/406,457	7/307,183	1/608	7/293,774
Special Designations				
Total Acres of Special Designations (ACECs, WSR-eligible waterways managed as suitable, WSAs)	184,879 ⁴	1,558,247	55,338	646,543
Areas of Critical Environmental Concern				
Number/Total Acres of ACECs	9/119,622	15/1,492,990	0/0	8/243,838
Congressionally Designated Trails				
Recreation Specific Beneficial Outcomes of Congressionally Designated Trails	Lowest Potential. No allowable use decisions or management actions to protect important recreation areas or the recreation setting.	Highest Potential. Allowable use decisions and management actions within SRMAs designed to meet visitor demand and sustain and/or enhance the recreation setting.	Moderate Potential. No allowable use decisions or management actions to protect important recreation areas or meet visitor demand. Limited protection for the recreation setting.	Highest Potential. Allowable use decisions and management actions within SRMAs designed to meet visitor demand and sustain and/or enhance the recreation setting. Implementation of the NTMC.
Effect on Visual Resource within Congressionally Designated Trail Landscapes	Highest Potential. 15% of the corridor ⁵ area managed as VRM Classes I-II. 85% managed as VRM Class III-IV.	Low Potential. 94% of the corridor area managed as VRM Classes I-II. 6% managed as VRM Class III-IV.	Moderate Potential. 5% of the corridor ⁵ area managed as VRM Classes I-II. 95% managed as VRM Class III-IV.	Low Potential. 97% of the NTMC is managed as VRM Classes I-II. 3% managed as VRM Class III-IV.
Socioeconomics				

Resources	Alternative A	Alternative B	Alternative C	Alternative D
Effect on Planning Area Population	Lowest Potential. Activities related to oil and gas, livestock grazing, and recreation will support 2.9% of employment in the planning area. BLM-authorized activities are not anticipated to alter historical population trends in the planning area.	Highest Potential. Activities related to oil and gas, livestock grazing, and recreation will support 2.1% of employment in the planning area. The decrease in employment opportunities may decrease the population in the planning area.	Lowest Potential. Activities related to oil and gas, livestock grazing, and recreation will support 2.9% of employment in the planning area. BLM-authorized activities are not anticipated to alter historical population trends in the planning area.	Low Potential. Activities related to oil and gas, livestock grazing, and recreation will support 2.8% of employment in the planning area. BLM-authorized activities are not anticipated to alter historical population trends in the planning area.
Effect on Housing and Community Services	Lowest Potential. Alternative A is not anticipated to result in a change in the total demand for housing or its geographical distribution.	Highest Potential. Alternative B may result in the greatest decrease in population and, therefore, a decreased demand for housing and community services as well as a reduced tax base for providing community services.	Lowest Potential. Alternative C will result in approximately the same population and, therefore, the same demand for housing and community services compared to Alternative A.	Moderate Potential. Alternative D will result in similar demands for housing and community services as Alternative A, but a slightly smaller tax base for providing these services.
Impacts on Quality of Life and Local Culture	Lowest Potential. As Alternative A continues existing BLM policies in their current state, quality of life and local culture will be impacted minimally. Alternative A will have relatively little impact on the economics of ranching.	Highest Potential. Economic opportunities are reduced but impacts to air quality and other nonmarket values will be less than historic trends. Subdivision of ranch land may be more intense than historic trends as ranching becomes less economically viable.	Moderate Potential. Alternative C will result in similar economic opportunities as Alternative A, but greater adverse impacts to air quality, wildlife, and other resources. Alternative C will have relatively little impact on the economics of ranching.	Moderate Potential. Economic opportunities are slightly reduced, as are adverse impacts to air quality, wildlife, and other resources related to natural characteristics. Alternative D will have relatively little impact on the economics of ranching.
Forecasted annual earnings (millions of 2007 dollars) due to activities on BLM-administered surface ⁶	195.6	138.8	195.9	184.2
Forecasted annual employment due to activities on BLM-administered surface ⁶	3,622	2,621	3,617	3,424

Resources	Alternative A	Alternative B	Alternative C	Alternative D
¹ The visual resources inventory is used to classify the aesthetic value of BLM-administered lands based on scenic quality, visual sensitivity, and distance from travel or observation points. VRM Classes establish a measurable standard for the amount of change allowed to a specific area's visual resource. For example, under Alternative A, 8.5 percent of the planning area is managed as VRM Class II, yet 23.5 percent is rated as Class II, suggesting a high potential for impacts to visual resources in these areas. ² Permitted AUMs are AUMs that are allowed on a permit/lease that can be used on any given year provided the forage is available. ³ Actual AUMs are the AUMs actually billed for and paid for each year by the permittee/lessee. The ratio of historical average authorized use to permitted use in the planning area is 73 percent. The ratio of actual use to permitted used under Alternative B is projected to increase gradually over the life of the plan to 95 percent. See Appendix L (p. 1583) and the <i>Livestock Grazing</i> section of Chapter 4 for further discussion regarding reductions in AUMs. ⁴ All eligible waterways under Alternative A are managed to protect the free-flowing outstandingly remarkable values and tentative classification. ⁵ The trail corridor encompasses ¼ mile on either side of the trails. ⁶ Estimate of annual earnings and employment includes direct, indirect, and induced economic activity (the “multiplier effect”).				
ACEC Area of Critical Environmental Concern			NAAQS National Ambient Air Quality Standards	
AUM animal unit month			ROW right-of-way	
BLM Bureau of Land Management			SRMA Special Recreation Management Area	
CBNG coalbed natural gas			VRM Visual Resource Management	
CO ₂ carbon dioxide			VOC Volatile Organic Compound	
DDA Designated Development Area			WAAQS Wyoming Ambient Air Quality Standards	
HMA Herd Management Area			WSA Wilderness Study Area	
INNS invasive nonnative species			WSR Wild and Scenic River	
LRP Limited Reclamation Potential			WUI Wildland Urban Interface	
NTMC National Trails Management Corridor			< less than	
MIST Minimum Impact Suppression Tactics			% percent	

Chapter 3. Affected Environment

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Introduction

This chapter describes existing conditions for Bureau of Land Management (BLM) resource programs, resource uses, special designations, and the socioeconomic environment in the Lander Field Office planning area. This description of the affected environment uses the best and most recent data available. This chapter does not provide detail about environmental components that would not be affected or that are not essential to the resolution of planning issues.

In addition to describing existing conditions, where appropriate, this chapter identifies management challenges for resource programs and resource uses on BLM-administered land. The BLM Analysis of the Management Situation (AMS) and the scoping process for revising the 1987 Lander Resource Management Plan (RMP) (existing plan) identified these management challenges. By describing existing conditions for resource programs in the planning area, this chapter serves as the baseline against which Chapter 4 analyzes and compares potential impacts of the alternatives.

A variety of laws, regulations, policies, and other requirements direct management of resources and resource uses on BLM-administered public lands. The Lander Field Office operates under applicable requirements and guidance provided in Appendix A (p. 1427). The Lander Field Office also requires management practices as design features to minimize environmental impact in the management of resources and resource uses on BLM-administered lands (Appendix H (p. 1521)).

Acreage and Geographic Information System Calculations

The majority of acreage and miles in this document are calculated using Geographic Information Systems (GIS). The use of GIS spatial analysis can provide precise acreage calculations. However, the acreage values are only as accurate as the data that is entered. Various factors can affect the accuracy of data including data collection and entry, scale, and timeframe. Until these calculations are confirmed through field surveys using a Global Positioning System, all GIS calculations in this document should be considered approximate.

Overview of the Lander Field Office Planning Area

The Lander Field Office planning area covers approximately 6,487,464 acres of federal, state, tribal, and private land in Carbon, Fremont, Hot Springs, Natrona, and Sweetwater Counties, Wyoming. A small portion of Teton County is within the planning area; however, there are no BLM-administered lands within Teton County in the planning area and the RMP makes no management decisions for Teton County lands. Public land in the planning area includes most of Fremont County, the southwest corner of Natrona Country, and small portions of Carbon, Sweetwater, and Hot Springs Counties. There are many isolated parcels of state and private land dispersed throughout the planning area intermingled with public land. Management decisions and prescriptions in this document apply only to BLM-administered surface lands (BLM-administered surface) and federal mineral estate in the planning area. Of the total planning area, approximately 2,394,210 acres are BLM-administered surface (Map 1) and 2,809,101 acres are BLM-administered federal mineral estate (Map 2). Approximately 2.2 million acres of the planning area are within the Wind River Indian Reservation (WRIR). Various locations referred to throughout this document are displayed on Map 3.

The BLM has a fiduciary trust responsibility for the management of minerals on the WRIR. The BLM does not make land management decisions for the WRIR, and duties associated with trust responsibilities are performed independent of the provisions of the Lander RMP. Information the BLM obtained and used pursuant to its exercise of duties associated with trust responsibility is considered proprietary to the WRIR and the BLM treats this information as confidential.

The geologic setting in the planning area is one of basins, separated and surrounded by mountain ranges, including the Owl Creek, Bridger, Bighorn, Ferris, Washakie, Absaroka, Wind River, Granite, and Rattlesnake Ranges. Most of the planning area is in the Wind River Basin; approximately one-third of the planning area is within the Granite Mountain Range landform, and fewer than 150,000 acres in the southern part of the planning area are in the Great Divide Basin.

There are two main hydrologic basins in the planning area: the Wind River and Popo Agie River basins, which drain most of the area north of Beaver Rim, and North Platte River Basin of which its tributary, the Sweetwater River drains the area south of Beaver Rim. There is a minor acreage drained directly to the North Platte River in the far eastern portion of the planning area in southeast Natrona County. Roughly 150,000 acres of the Great Divide Basin, a hydrologically closed basin with no external drainage, is found along the far southern boundary of the planning area; most of this basin occurs in a 7 to 9 inch annual precipitation zone.

Elevations in the planning area range from 4,750 feet to 10,400 feet, which support habitats including coniferous forests, juniper woodlands, aspen stands, mountain shrub, canyons and rim rock, badlands, sagebrush-steppe shrublands, grasslands, and riparian-wetland areas. The dominant vegetation type in the planning area is sagebrush, which is found throughout the planning area and occupies valleys and basins. Juniper and limber pine occur on slopes and in mountainous areas, and lodgepole/limber pine mixed with aspen occur in higher elevations.

BLM-administered public lands in the planning area support a variety of game and nongame wildlife species, including several special status species. These lands contain a variety of habitats that possess the biological and physical attributes important in the life-cycles of many wildlife species. The diversity of habitats and landscapes provides important areas for wildlife breeding, birthing, foraging, wintering, and migration.

The soils of the planning area are typical for arid and semiarid, cold deserts and sub-humid mountainous areas of the world that have a continental climate. Summers are generally short and hot and winters long and cold. Annual precipitation ranges from 5 to 9 inches in the Wind River Basin and 15 to 19 inches in the foothills of the Wind River Mountains. The mountain areas have a sub-humid, continental climate. Drought is common in the planning area. With drought comes increased risk of fire, decreased vegetation for forage and soil cover, accelerated soil erosion by wind, and decreased air quality from additional particulate matter (PM) in the air.

The soils in the Wind River and Great Divide Basins are typical for those of high, semiarid, cold deserts. Soils of the planning area vary greatly in potential and capability for any given use. Some soils produce abundant vegetation, other soils do not. Some soils support winter habitat for wildlife, others support summer habitat. Some soils are easier to rehabilitate after disturbance than other soils.

Economic development in the planning area has been based on resource extraction, tourism, and agriculture. Oil and gas development is an important economic component of public land use in the planning area. Tourism has historically been a substantial economic generator, primarily in the

Dubois and Lander areas. Agriculture, particularly cattle and sheep ranching, has also contributed to the economy and the social fabric of communities in the planning area.

The availability of a wide spectrum of recreational opportunities on public lands is an important component of public land use, lifestyles, and communities in the planning area. Many towns in the planning area serve as “gateway cities” for recreation activities in Yellowstone and Teton National Parks and their own recreation destinations. Recreation resources in the planning area include both developed and undeveloped opportunities.

Fremont County

The Wyoming Territorial Legislature established Fremont County in 1884, and named Lander the county seat. The earliest historic records indicate that the Shoshone and Crow bands originally occupied Fremont County. In the 1820s and 1830s, fur traders explored much of Fremont County and John C. Fremont explored and mapped southern Fremont County along the Oregon Trail in 1842 and 1843. The South Pass gold rush of 1867 brought an influx of thousands of people, which accelerated the settlement of Fremont County and the development of early farms and villages. The creation of the WRIR in 1868 was another important event that accelerated the settlement of the county.

Fremont County is the second largest county in land size (after Sweetwater County, Wyoming) in the six Rocky Mountain states. The Oregon, Mormon, California, and Pony Express Trails cross the southern portion of the county, and Dubois, a gateway town for Yellowstone National Park and Grand Teton National Park, lies in the northwest corner of the county. Lander is home to the Wyoming State Life Resource Center and several non-profit organizations including the National Outdoor Leadership School (NOLS), The Nature Conservancy, and the Wyoming Outdoor Council. The largest community in the county is Riverton, home of Central Wyoming College. A large portion of the western edge of the county follows the Continental Divide at the crest of the Wind River Range of the Rocky Mountains. U.S. Highway 287 crosses the southern and western portions of Fremont County, and intersects Highway 28 just south of Lander. The Sweetwater River, the second largest river in the planning area, runs east-west in the southern portion of the planning area. The southern boundary of Fremont County is south of the Sweetwater River, more or less along the northern edge of the Great Divide Basin.

Fremont County comprises 2,751,355 acres of surface area in the central portion of the planning area, of which the BLM administers approximately 1,933,364 acres. In addition, the Lander Field Office administers approximately 2,281,159 acres of federal mineral estate in the county. The WRIR, the historical home of the Eastern Shoshone and the Northern Arapaho Native American tribes, occupies approximately one-third of Fremont County. Parts of five counties are included within the planning area. Of these, Fremont County encompasses the largest amount of surface area.

Natrona County

Natrona County was officially established in 1890 after originally being a part of Carbon County. Casper, Wyoming, was designated as the county seat in 1890. Pioneers traveling west in the mid to late 1800s followed both the Mormon and Oregon Trails, which cross present-day Natrona County. Early pioneers established homesteads in the late 1800s and settlers used the open rangelands for cattle and sheep ranching.

Oil and gas prospecting began in Natrona County in the 1870s and accelerated economic and population growth in the county. Oil and gas development continues to be an important contributor to the local economy in the county. The important historical sites of Split Rock, Martin's Cove, and Devil's Gate are along portions of the Mormon and Oregon Trails in the planning area. Wyoming Highway 220 runs in a northeast-southwest direction in the southwestern portion of the county.

Natrona County covers approximately 422,519 acres of surface area in the easternmost portion of the planning area, of which the BLM administers approximately 297,991 acres. In addition, the Lander Field Office administers approximately 364,256 acres of federal mineral estate in the county.

Carbon County

Carbon County was originally established in 1868 as a county in the Dakota Territory. Rawlins, Wyoming, was later named the county seat. Carbon County has a rich history of ranching, mining, and railroad development and use. Highway 287 runs through the northwestern portion of the county in the planning area.

Carbon County covers approximately 45,434 acres of surface area in the southeastern portion of the planning area, of which the BLM administers approximately 38,406 acres. In addition, the Lander Field Office administers approximately 41,482 acres of federal mineral estate in the county. Carbon County has the second least amount of BLM-administered surface area of the five counties in the planning area.

Sweetwater County

Sweetwater County was established in 1867, the same year Green River, Wyoming, was named the county seat. Several emigrant trails, which are now historic trails, pass through the county, including the Oregon, California, Mormon, Overland, and Pony Express Trails. Construction of the transcontinental railroad in 1868 accelerated development in the county's two major population centers, Green River and Rock Springs.

Highway 28 parallels the Oregon, Mormon, California, and Pony Express Trails. Interstate 80 crosses the southern portion of Sweetwater County in an east-west direction. Along with mineral commodities, agriculture is an important commodity and economic contributor in the county.

Sweetwater County covers approximately 128,335 acres of surface area in the southernmost portion of the planning area, of which the BLM administers approximately 122,670 acres. In addition, the Lander Field Office administers approximately 119,407 acres of federal mineral estate in the county.

Hot Springs County

Hot Springs County was established in 1911, with Thermopolis serving as the county seat. Oil and gas, as well as coal extraction, helped accelerate the growth of the county in the early 1900s. Hot Springs County is home to reputedly the world's largest mineral hot springs, located near Thermopolis in Hot Springs State Park. Hot Springs County contains a relatively large amount of paleontological resources, including dinosaur fossils. Important recreational opportunities in the county include rafting and fishing in Wind River Canyon and on the Bighorn River.

Hot Springs County covers approximately 3,244 acres of surface area in the north-central portion of the planning area, of which the BLM administers approximately 1,779 acres. In addition, the Lander Field Office administers approximately 2,796 acres of federal mineral estate in the county. Hot Springs County has the least amount of BLM-administered surface area of the five counties in the planning area.

Wind River Indian Reservation

The Bridger-Teton Treaty with the federal government in 1868 established the WRIR. In 1868, Chief Washakie signed a treaty making the WRIR home to the Eastern Shoshone. A band of Northern Arapaho moved from Colorado to the WRIR in 1868. Today the Eastern Shoshone and the Northern Arapaho share the reservation and govern it jointly, with each tribe holding 50 percent interest in the land, water, and other natural resources. Fort Washakie, the only military fort named for an American Indian chief, is now the headquarters of the Eastern Shoshone government and the U.S. Department of the Interior (DOI) Bureau of Indian Affairs.

The WRIR includes approximately one-third of Fremont County and approximately one-fifth of Hot Springs County. Encompassing approximately 2.2 million acres, the WRIR is the seventh largest Indian reservation in the United States. Within the Lander Field Office boundaries, the WRIR occupies 2,253,375 acres.

3.1. Physical Resources

This section describes the current condition of air quality, geologic resources, soil, water, cave and karst resources and lands with wilderness characteristics. Each of the resource sections includes a definition and description of the resource, the current condition of the resource, and management challenges for the resource.

3.1.1. Air Quality

This section describes the climate and existing air quality in the region potentially affected by the alternatives described in Chapter 2. Air pollutants addressed include criteria pollutants, hazardous air pollutants (HAPs), and compounds that could impair visibility or contribute to atmospheric deposition.

Wyoming Standards for Healthy Rangelands apply to all activities authorized by the Lander Field Office. Standard 6 states that air quality will meet state standards (Appendix J (p. 1537)). Standard 6 identifies the BLM's role in complying with all federal, state and other applicable regulations regarding air quality and clarifies that the State of Wyoming administers the Clean Air Act (CAA).

Air Quality Indicators

Air pollutants addressed in this section include criteria air pollutants, HAPs, and sulfur and nitrogen compounds, which could impair visibility and contribute to atmospheric deposition, including acid rain. State and National Ambient Air Quality Standards (NAAQS) set the maximum thresholds for criteria air pollutants. The Wyoming Prevention of Significant Deterioration (PSD) program establishes allowable increases of a given pollutant for a particular area from specific sources. These standards and programs typically affect Class I or Sensitive Class II Wilderness Areas.

Criteria Air Pollutants

The U.S. Environmental Protection Agency (EPA) established air quality standards for criteria pollutants (the NAAQS). Concentrations of air pollutants greater than the national standards represent a risk to human health. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), particulate matter (PM₁₀ and PM_{2.5}), and lead (Pb).

Hazardous Air Pollutants

There is a wide variety of HAPs, including benzene, toluene, ethylbenzene, xylene (also referred to as BTEX), N-hexane, and formaldehyde. Although HAPs do not have federal air quality standards, the EPA has issued reference concentrations for evaluating the inhalation risk for cancerous and noncancerous health impacts, known as reference concentrations for chronic inhalation.

Wyoming and National Ambient Air Quality Standards

Wyoming Ambient Air Quality Standards (WAAQS) and NAAQS identify maximum limits for criteria air pollutant concentrations at all locations to which the public has access. The WAAQS and NAAQS are legally enforceable standards. Concentrations above the WAAQS and NAAQS represent a risk to human health that by law, require public safeguards be implemented. State standards must be at least as protective of human health as federal standards, and may be more restrictive than the federal standards as allowed by the CAA.

Visibility

Visibility can be expressed in terms of deciviews, a measure of perceived changes in visibility. One deciview is a change in visibility just perceptible to an average person, which is approximately a 10 percent change in light extinction. To estimate potential visibility impairment, monitored aerosol concentrations are used to reconstruct visibility conditions for each day monitored. These daily values are then ranked from clearest to haziest and divided into three categories to indicate the mean visibility for all days (average), the 20 percent of days with the clearest visibility (20 percent clearest), and the 20 percent of days with the worst visibility (20 percent haziest). Visibility can also be defined by standard visual range (SVR) measured in miles, and is the farthest distance at which an observer can see a black object viewed against the sky above the horizon; the larger the SVR, the cleaner the air.

Since 1980, the Interagency Monitoring of Protected Visual Environments (IMPROVE) network has measured visibility in national parks and wilderness areas. The CAA amendments of 1977 designated 156 areas (primarily national parks and wilderness) as federally mandated Class I areas and are accorded strict levels of air quality protection. There are six IMPROVE stations in Wyoming, but none in the planning area. One of the monitors is the North Absaroka site in the Bighorn Basin planning area to the north, and another is the Pinedale site in the Pinedale planning area to the west.

Atmospheric Deposition

Atmospheric deposition refers to processes in which air pollutants are removed from the atmosphere and deposited into terrestrial and aquatic ecosystems. Air pollutants can be deposited by either wet precipitation (via rain or snow) or dry (gravitational) settling of particles and adherence of gaseous pollutants to soil, water, and vegetation. Much of the concern about

deposition surrounds the secondary formation of acids and other compounds from emitted nitrogen and sulfur species such as nitrogen oxides (NO_x) and SO_2 , which can contribute to acidification of lakes, streams, and soils and affect other ecosystem characteristics, including nutrient cycling and biological diversity.

Substances deposited include:

- Acids, such as sulfuric (H_2SO_4) and nitric (HNO_3), sometimes referred to as acid rain
- Air toxics, such as pesticides, herbicides, and volatile organic compounds (VOCs)
- Heavy metals, such as mercury
- Nutrients, such as nitrates (NO_3^-) and ammonium (NH_4^+)

Rain, snow, cloud water, particle settling, and gaseous pollutants complicate the accurate measurement of atmospheric deposition. Deposition varies with precipitation and other meteorological variables (such as temperature, humidity, winds, and atmospheric stability), which in turn, vary with elevation and time.

Air Quality Monitoring, Visibility, and Deposition in the Lander Planning Area

Various state and federal agencies monitor air pollutant concentrations, visibility, and atmospheric deposition throughout Wyoming, and there are four monitors in the planning area (Lander, South Pass, South Pass City, and Sinks Canyon). Table 3.1, “Air Quality Monitoring Sites In or Near the Planning Area” (p. 272) lists the available air quality monitoring sites in the planning area and in other nearby planning areas. The Wyoming Department of Environmental Quality (DEQ) operates a $\text{PM}_{2.5}$ monitor as part of the State and Local Air Monitoring Stations (SLAMS) network in Lander. The Special Purpose Monitoring (SPM) site at South Pass measures O_3 , nitrous oxides (N_2O), PM_{10} , and SO_2 . A new air quality monitoring station has been established in the Frenchie Creek area by an oil and gas operator but the Wyoming DEQ has no administrative oversight of the station. A new SLAMS air quality monitoring station was established by Wyoming DEQ in January 2010 at the Juel Spring site, which is located 20 miles northwest of Farson in Sublette County.

The U.S. Forest Service (USFS) operates an IMPROVE monitor in the North Absaroka Wilderness Area in Park County (in the Bighorn Basin planning area) and another IMPROVE monitor is operated at Pinedale in neighboring Sublette County. The Sinks Canyon and South Pass City monitors, which the BLM operate as part of the National Atmospheric Deposition Program (NADP), measure atmospheric deposition (wet) of NH_4^+ , sulfate (SO_4), and various metals.

Table 3.1. Air Quality Monitoring Sites In or Near the Planning Area

County	Site Name	Type of Monitor	Parameter	Operating Schedule	Location	
					Longitude	Latitude
Fremont	Lander	SLAMS	PM _{2.5}	Once every 3 days	-108.733	42.833
	South Pass	SPM	O ₃ , NO _x , PM ₁₀ , SO ₂	Hourly & once every 3 days (PM ₁₀)	-108.431	42.315
	South Pass City	NADP	NH ₄ , NO ₃ , SO ₄ wet deposition, precipitation	Daily precipitation, weekly concentrations	-108.832	42.494
	Sinks Canyon	NADP	NH ₄ , NO ₃ , SO ₄ wet deposition, precipitation	Daily precipitation, weekly concentrations	-108.850	42.734
Park	North Absaroka	IMPROVE	PM _{2.5} , NO ₃ , NH ₄ , HNO ₃ , SO ₄ , SO ₂ , and meteorology	Once every 3 days	-109.382	44.745
Sublette	Bridger Wilderness	IMPROVE	PM _{2.5} , NO ₃ , NH ₄ , HNO ₃ , SO ₄ , SO ₂ , and meteorology	Once every 3 days	-109.758	42.975
Uinta	Murphy Ridge	SLAMS	CO	Hourly	-111.042	41.373
Sources: EPA 2009a; IMPROVE Data 2009; NADP 2009 CO Carbon Monoxide HNO ₃ Nitric Acid IMPROVE Interagency Monitoring of Protected Visual Environments NADP National Acid Deposition Program NH ₄ Ammonium NO _x Nitrogen Oxides NO ₃ Nitrate O ₃ Ozone PM _{2.5} Particulate matter less than 2.5 microns in diameter PM ₁₀ Particulate matter less than 10 microns in diameter SLAMS State and Local Air Monitoring Stations SPM Special Purpose Monitoring SO ₂ Sulfur Dioxide SO ₄ Sulfate						

Climate in the Planning Area

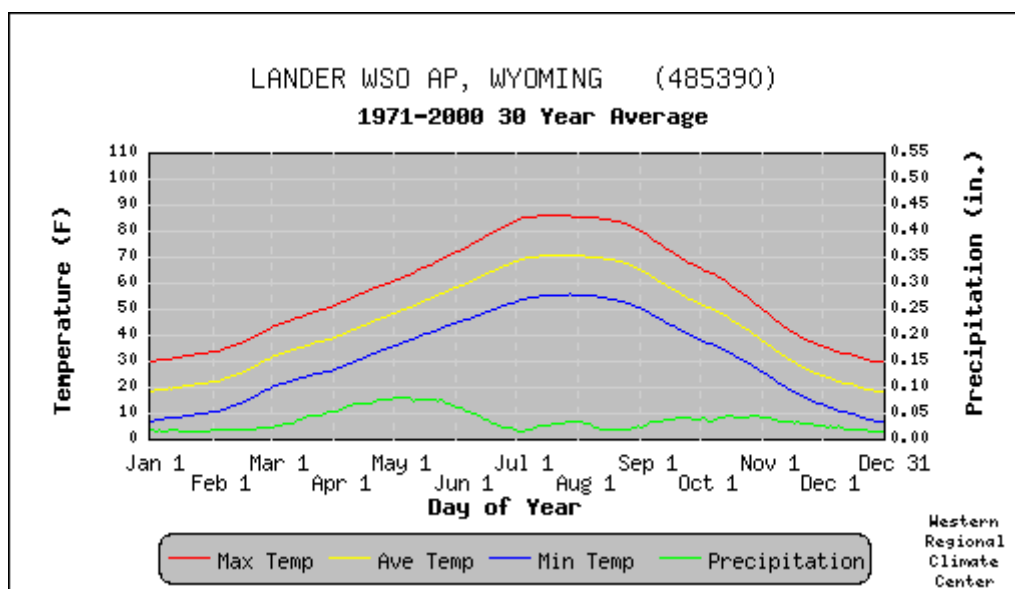
The climate in the planning area is designated as a combination of Intermountain Semi-Desert and Southern Rocky Mountain Steppe. Summers are generally short and hot and winters long and cold. Precipitation has historically been low, though greater at higher elevations, and distributed across the year, with the exception of the drier summer months. Wind speeds are variable but strong, which helps disperse airborne pollutants.

Table 3.2, “Summary of Climate in the Planning Area” (p. 273) lists temperature, precipitation, and wind speed data for the planning area. This information is derived from daily ambient measurements at the Lander monitor from 1971 through 2000.

Figure 3.1, “Average Monthly Temperature and Precipitation for Lander, Wyoming, 1971-2000” (p. 273) illustrates the general climate in Lander, Wyoming, showing long-term monthly averages of temperature and precipitation as recorded at the Lander Airport. While there is considerable variation in temperature and precipitation throughout the planning area, the relative relationships of temperature and precipitation throughout the year are similar in most areas.

Table 3.2. Summary of Climate in the Planning Area

Climate Component	Description
Temperature	Daily maximum summer temperature: 86.3°F Daily minimum winter temperature: 8.7°F Mean annual temperature: 45°F
Precipitation	Mean annual precipitation: 13.4 inches Mean annual snowfall: 103.6 inches Mean winter snow depth: 4.25 inches (November through February)
Winds	Mean annual wind speed: 6.8 mph Prevailing wind direction: southwesterly
Source: Western Regional Climate Center Data 2009 °F degrees Fahrenheit mph miles per hour	



Source: BLM 2009a

AP Airport

°F degrees Fahrenheit

in inches

WSO Bureau of Land Management Wyoming State Office

Data are smoothed using a 29-day running average.

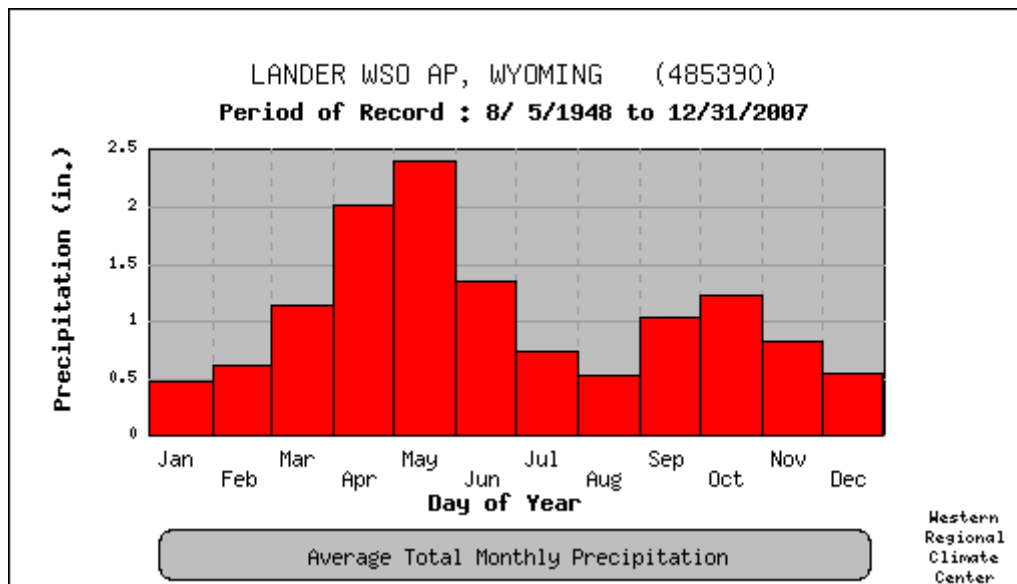
Figure 3.1. Average Monthly Temperature and Precipitation for Lander, Wyoming, 1971-2000

Long-term average annual precipitation varies from less than 6 inches in the area north of the town of Shoshoni, to 20 inches or more in the mountainous area near Dubois (Map 9). Away from the truly arid area north of Shoshoni, most annual precipitation occurs as snow. As a rule, the highest elevations in the mountains receive the most precipitation and the lowest elevations the least. Table 3.3, “Average Annual Precipitation for Locations in the Planning Area” (p. 274) lists average annual precipitation data for representative locations derived from various monitors, as archived by the National Oceanic and Atmospheric Administration.

Table 3.3. Average Annual Precipitation for Locations in the Planning Area

Location	Inches of Total Precipitation (inches of snow)
South Pass	13.3 (119.4)
Muddy Gap	9.9 (50.8)
Sand Draw	9.6 (52.7)
Dubois	8.8 (41.7)
Boysen Dam	9.0 (13.7)
Lander	13.4 (98.8)
Source: BLM 2009a	

In most areas, there is a peak period of precipitation in the spring and a secondary peak in the fall. Figure 3.2, “Average Monthly Total Precipitation for Lander, Wyoming, 1948-2007” (p. 274) depicts Lander’s monthly average precipitation and shows the April-May-June and mid-September to mid-November peaks.



Source: BLM 2009a

in. inches

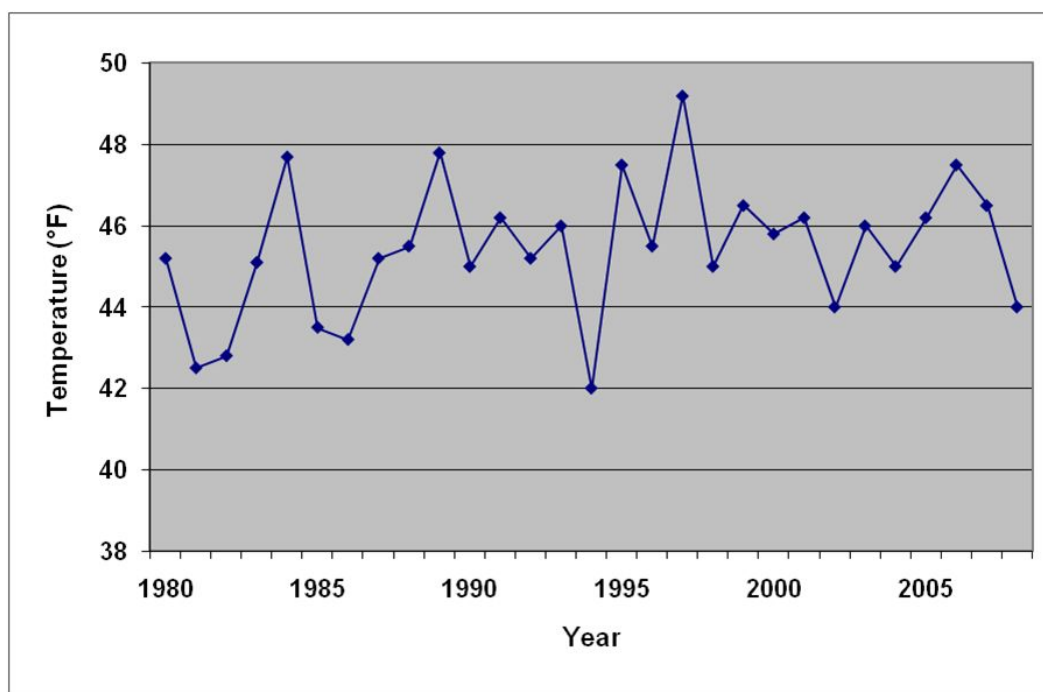
Figure 3.2. Average Monthly Total Precipitation for Lander, Wyoming, 1948-2007

The planning area receives a high amount of sunshine, from 60 percent of the possible amount during winter to approximately 75 percent during the summer. Mountain areas receive less sunshine, and in winter the estimated amount over the mountains is approximately 45 percent. Because the altitude provides less atmosphere for the sun’s rays to penetrate and because of the small amount of fog, haze, and smoke, the intensity of sunshine is especially high. The average

relative humidity is low, which, with the high percentage of sunshine and rather high winds, all contribute to a high rate of evaporation. The overall average amount of evaporation ranges from 30 to approximately 50 inches (Curtis and Grimes 2004).

Although Wyoming is windy and ranks first in the United States with an annual average wind speed of 12.9 miles per hour, Lander and much of the Wind River Basin have average daily wind speeds of about half the state average.

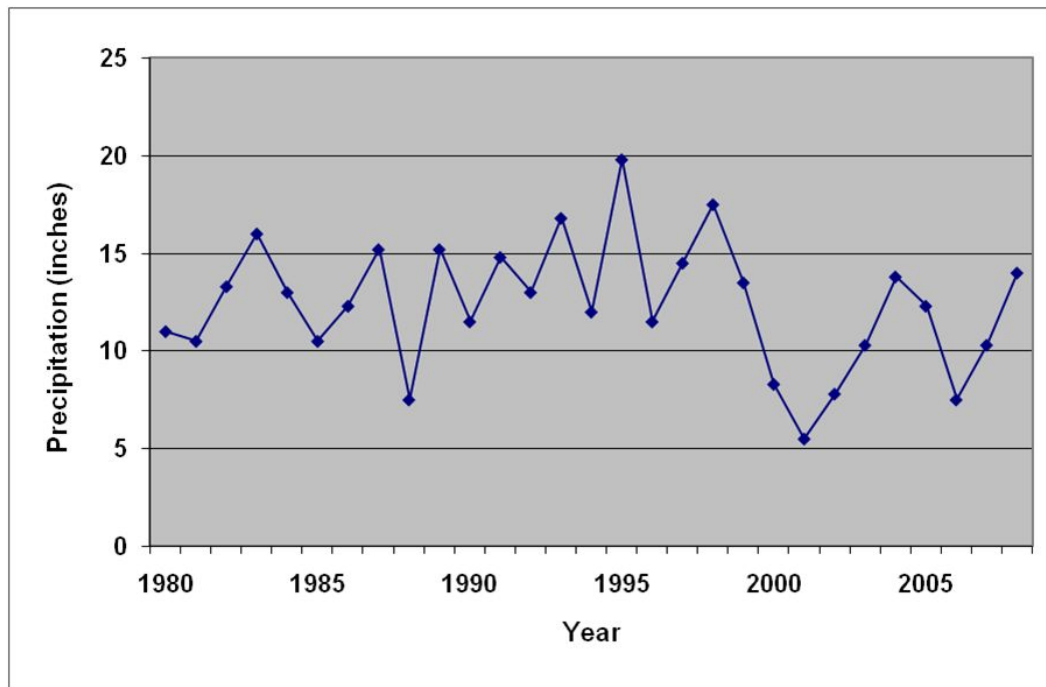
Figure 3.3, “Average Annual Temperature (°F) for Hunt Field, Lander, Wyoming, 1979-2008” (p. 275) and Figure 3.4, “Average Annual Precipitation (inches) for Hunt Field, Lander, Wyoming, 1979-2008” (p. 275) show 30-year trends in annual average temperature and precipitation for the Hunt Field site in Lander. The figures indicate a slight increase in average temperature over the 30-year period and a decrease in annual average precipitation over this period. The below average precipitation during the last 10 years is a reflection of drought conditions that have been pervasive throughout the western United States.



Source: NOAA 2009

°F degrees Fahrenheit

Figure 3.3. Average Annual Temperature (°F) for Hunt Field, Lander, Wyoming, 1979-2008



Source: NOAA 2009

Figure 3.4. Average Annual Precipitation (inches) for Hunt Field, Lander, Wyoming, 1979-2008

Air Quality

With a limited number of air quality monitors in the planning area, it is difficult to accurately assess existing air quality conditions throughout the area. As previously noted, a new SLAMS monitoring station was established in January 2010 at the Juel Spring site in Sublette County. However, air quality, visibility, and atmospheric deposition are monitored throughout Wyoming, including adjacent planning areas. Therefore, the assessment of recent air quality conditions in the Lander planning area has been conducted by examining data collected at the monitors within the area supplemented by various monitors in neighboring planning areas, as summarized in Table 3.4, “Applicable National and State Primary Air Quality Standards for Criteria Pollutants and Existing Representative Concentrations for the Planning Area” (p. 277). The examination of these data indicates that the current air quality for criteria pollutants in the planning area is considered good overall. Based on measurements within the area, visibility in the planning area is considered excellent.

Table 3.4, “Applicable National and State Primary Air Quality Standards for Criteria Pollutants and Existing Representative Concentrations for the Planning Area” (p. 277) provides an overview of applicable primary WAAQS and NAAQS and recent representative pollutant concentrations measured in the planning area and at nearby sites.

Table 3.4. Applicable National and State Primary Air Quality Standards for Criteria Pollutants and Existing Representative Concentrations for the Planning Area

Pollutant	Averaging Time	National Ambient Air Quality Standards (NAAQS)			Wyoming Ambient Air Quality Standards (WAAQS)			Representative Concentrations		
		(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)	(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)	(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)
Carbon Monoxide	1 hour ¹	35	35,000	40,000	35	35,000	40 (mg/m³)	0.7	700	801
	8 hour ¹	9	9,000	10,000	9	9,000	10 (mg/m³)	0.9	900	1,029
Nitrogen Dioxide	1 hour ²	0.1	100	189	---	---	---	---	---	---
	Annual (Arithmetic Mean)	0.053	53	100	0.05	50	100	0.002	2	3.4
PM ₁₀	24 hour ³	---	---	150	---	---	150	---	---	78
	Annual (Arithmetic Mean)	None			---	---	50	---	---	---
PM _{2.5}	24 hour ⁴	---	---	35	---	---	35	---	---	24.2
	Annual (Arithmetic Mean) ⁵	---	---	15.0	---	---	15.0	---	---	7.6
Ozone	8 hour ⁶	0.075	75	147	0.08	80	157	0.066	66	129
Sulfur Dioxide	1 hour ⁷	0.075	75	197	---	---	---	---	---	---
	3 hour ¹	None			0.50	500	1,300	---	---	---
	24 hour ⁸	None			0.10	100	260	0.001	0.57	1.48
	Annual (Arithmetic Mean)	None			0.02	20	60	0.0003	0.25	0.66

Note: **Bold** indicates the standard as written in the corresponding regulation. Other values are conversions.

Source: BLM 2009a

NAAQS National Ambient Air Quality Standards

PM_{2.5} particulate matter less than 2.5 microns in diameter

PM₁₀ particulate matter less than 10 microns in diameter

ppm parts per million

ppb parts per billion

$\mu\text{g}/\text{m}^3$ micrograms per cubic meter

mg/m³ milligrams per cubic meter

SLAMS State and Local Air Monitoring Stations

WAAQS Wyoming Ambient Air Quality Standards

WARMS Wyoming Air Resource Monitoring System

¹Not to be exceeded more than once per year. Data collected at Murphy Ridge in 2008.

²To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb. Data collected at Thunder Basin in 2008.

³Not to be exceeded more than once per year on average over three years. Maximum 24-hour average for 2008 at the South Pass site.

⁴To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor in an area must not exceed 35 $\mu\text{g}/\text{m}^3$. Maximum 24-hour average for 2006 for the Lander SLAMS site.

⁵To attain this standard, the three-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 $\mu\text{g}/\text{m}^3$ Annual average for 2008 for the Lander SLAMS site.

⁶To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor in an area over each year must not exceed 75 ppb. Measured fourth highest concentration for 2008 for the South Pass site.

⁷To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour

Pollutant	Averaging Time	National Ambient Air Quality Standards (NAAQS)			Wyoming Ambient Air Quality Standards (WAAQS)			Representative Concentrations		
		(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)	(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)	(ppm)	(ppb)	($\mu\text{g}/\text{m}^3$)

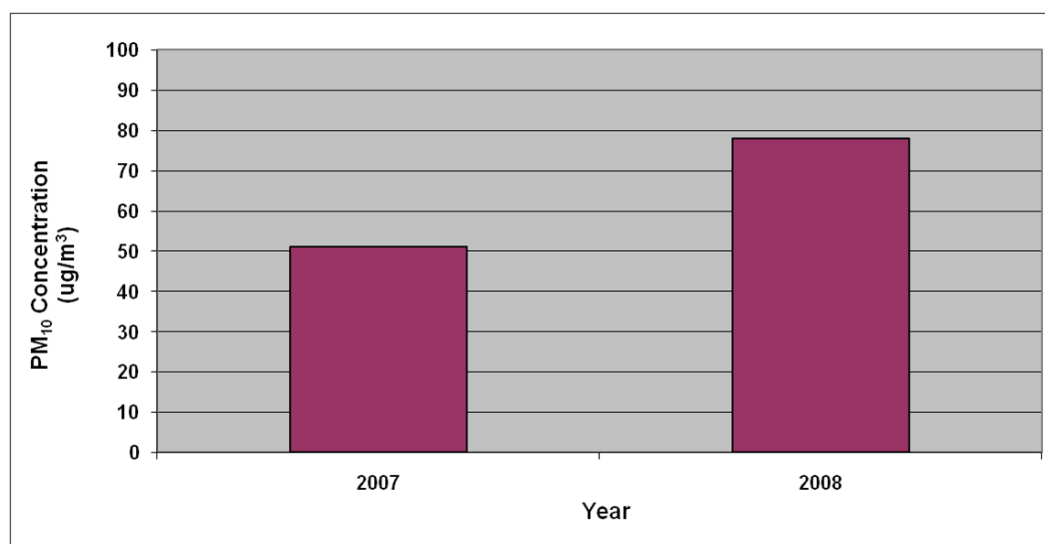
average at each monitor within an area must not exceed 75 ppb.
⁸Not to be exceeded more than once per year. Maximum 24-hour and annual averages for 2008 for the Sheridan WARMS site.

Trends in Air Quality

This section evaluates recent trends in air quality by examining data collected at the Lander, South Pass, South Pass City, and Sinks Canyon monitors in the Lander planning area, and as best as can be inferred by examining criteria pollutant, visibility, and deposition data collected at other monitoring sites in adjacent planning areas.

Air Pollutant Concentrations

Air quality data collected at the various monitors in and near the Lander planning area (Table 3.4, “Applicable National and State Primary Air Quality Standards for Criteria Pollutants and Existing Representative Concentrations for the Planning Area” (p. 277)) are presented for PM₁₀, PM_{2.5}, SO₂, and O₃. Figure 3.5, “Peak 24-Hour Average PM₁₀ Concentrations ($\mu\text{g}/\text{m}^3$) at the South Pass, Wyoming Site” (p. 278) shows annual peak 24-hour average PM₁₀ concentrations at the South Pass site for 2007 and 2008. For these years, peak 24-hour average measurements of PM₁₀ are well below the standard (150 micrograms per cubic meter [$\mu\text{g}/\text{m}^3$]), and no real trend can be discerned.



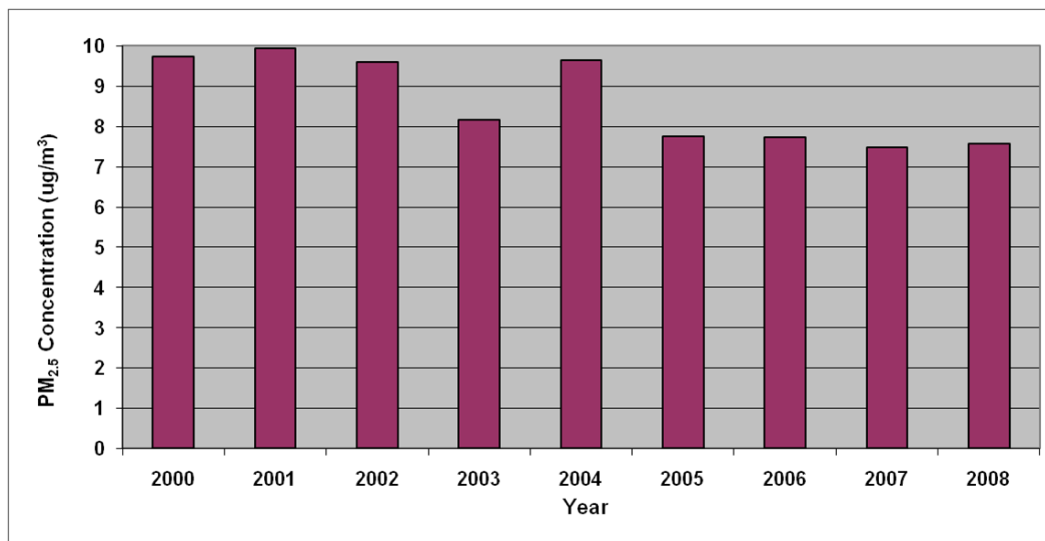
Source: EPA 2009a

PM₁₀ Particulate matter less than 10 microns in diameter
 $\mu\text{g}/\text{m}^3$ micrograms per cubic meter

Figure 3.5. Peak 24-Hour Average PM₁₀ Concentrations ($\mu\text{g}/\text{m}^3$) at the South Pass, Wyoming Site

Figure 3.6, “Annual Average PM_{2.5} Concentrations ($\mu\text{g}/\text{m}^3$) at the Lander, Wyoming Site” (p. 279) shows annual average PM_{2.5} data collected at the Lander monitor from 2000

through 2008. The data indicate that annual average $PM_{2.5}$ concentrations in the Lander area are well below the NAAQS, and trends are relatively flat during the last four years.

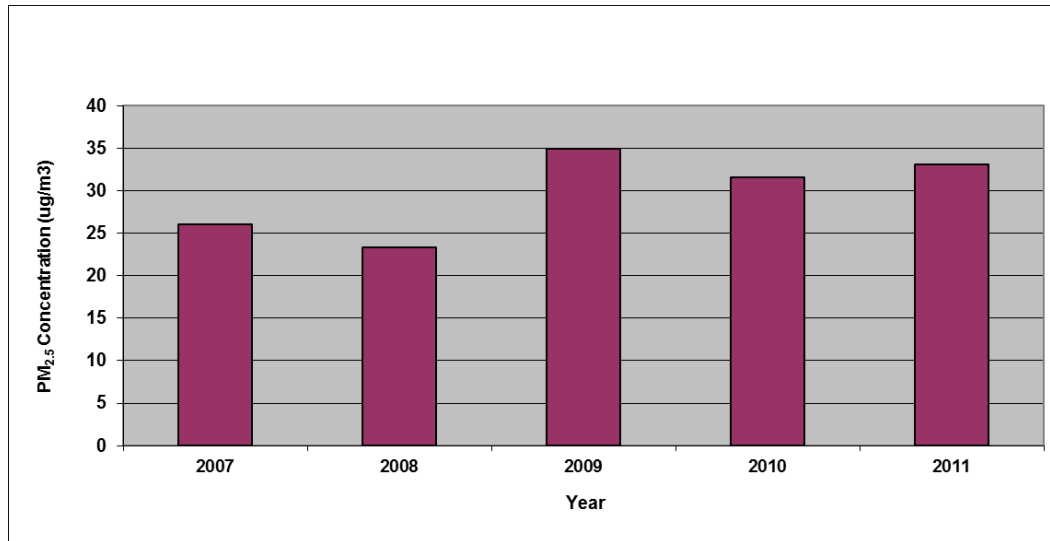


Source: EPA 2009a

$PM_{2.5}$ Particulate matter less than 2.5 microns in diameter
 $\mu g/m^3$ micrograms per cubic meter

Figure 3.6. Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$) at the Lander, Wyoming Site

Figure 3.7, “98th Percentile Concentrations of 24-hour Average $PM_{2.5}$ Concentrations ($\mu g/m^3$) at the Lander, Wyoming Site” (p. 279) shows 24-hour average $PM_{2.5}$ data collected at the Lander monitor from 2007 through 2011. The new 24-hour $PM_{2.5}$ standard, promulgated in 2005, requires that the three-year average of the 98th percentile of 24-hour concentrations at each monitor in an area must not exceed $35 \mu g/m^3$. The 2007 through 2011 Lander data show that this monitor is currently in compliance of the new 24-hour average $PM_{2.5}$ standard.

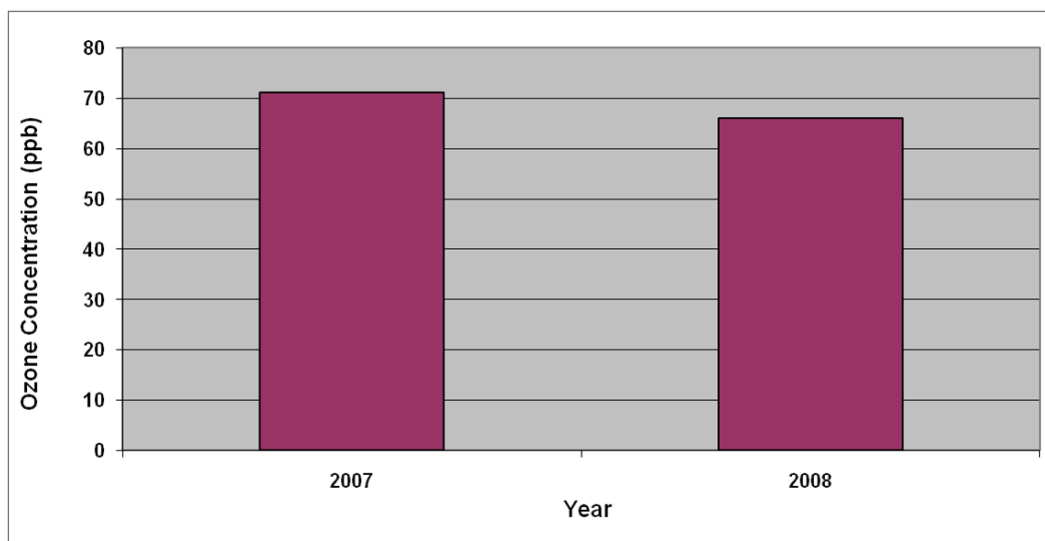


Source: EPA 2012a

PM_{2.5} Particulate matter less than 2.5 microns in diameter
 µg/m³ micrograms per cubic meter

Figure 3.7. 98th Percentile Concentrations of 24-hour Average PM_{2.5} Concentrations (µg/m³) at the Lander, Wyoming Site

Figure 3.8, “Fourth Highest Eight-Hour Average Ozone Concentrations (ppb) at the South Pass, Wyoming SPM Site” (p. 280) shows the fourth highest 8-hour average O₃ data for the South Pass site for 2007 and 2008. These data are used to determine the area’s O₃ “design value,” which is calculated as the three-year average of the fourth highest observed concentration. The design value is used to assess compliance with the national standard. Given that there are only two years of available data, it is not possible to properly calculate the design value. However, given these measurements, the estimated (two-year) design value is less than 70 parts per billion (ppb), which is below the 8-hour average O₃ standard of 75 ppb.



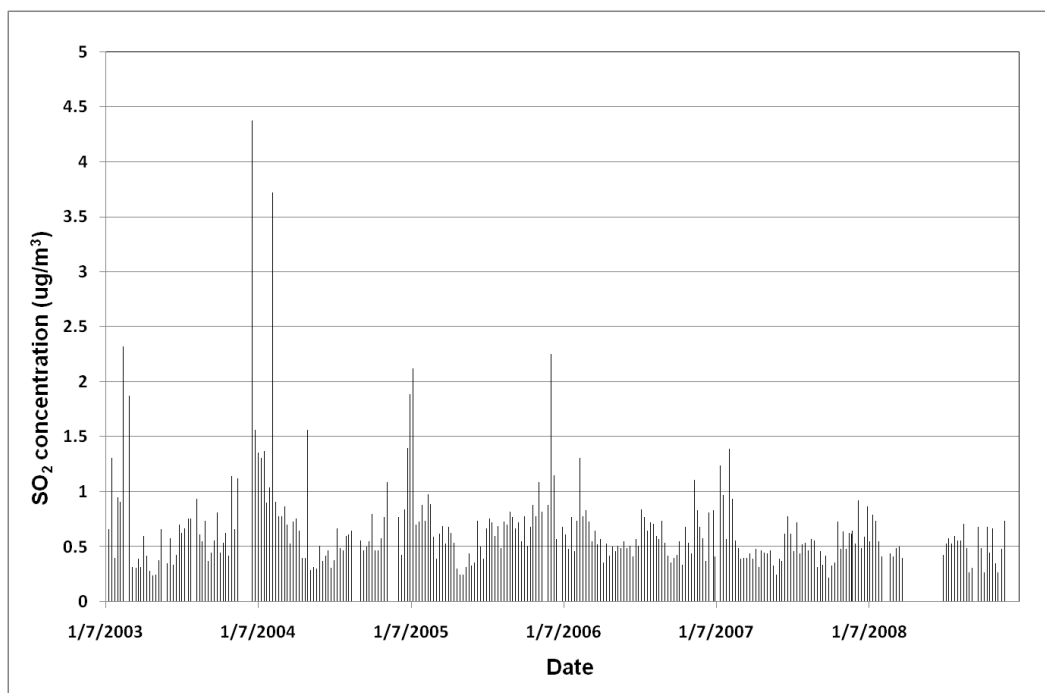
Source: Wyoming DEQ 2009

ppb parts per billion

SPM Special Purpose Monitoring

Figure 3.8. Fourth Highest Eight-Hour Average Ozone Concentrations (ppb) at the South Pass, Wyoming SPM Site

Although not in the planning area, monitoring data from the Buffalo site (in the Buffalo planning area) as part of the Wyoming Air Resource Monitoring System (WARMS) network provides a summary of observed concentrations of SO_2 . Figure 3.9, “Weekly SO_2 Concentration in Buffalo WARMS site” (p. 281) shows weekly average concentrations of SO_2 for the Buffalo site from 2003 to 2008. Although there are missing data for a number of weeks throughout this period, especially in 2008, the data show weekly and seasonal variations in SO_2 , with no discernable long-term trend over this period. Also, given its location and distance in relation to the Lander planning area, these data might not accurately reflect SO_2 concentrations in the Lander planning area.



Source: WARMS 2009

µg/m³ micrograms per cubic meter

SO₂ sulfur dioxide

WARMS Wyoming Air Resource Monitoring System

Figure 3.9. Weekly SO₂ Concentration in Buffalo WARMS site

Visibility

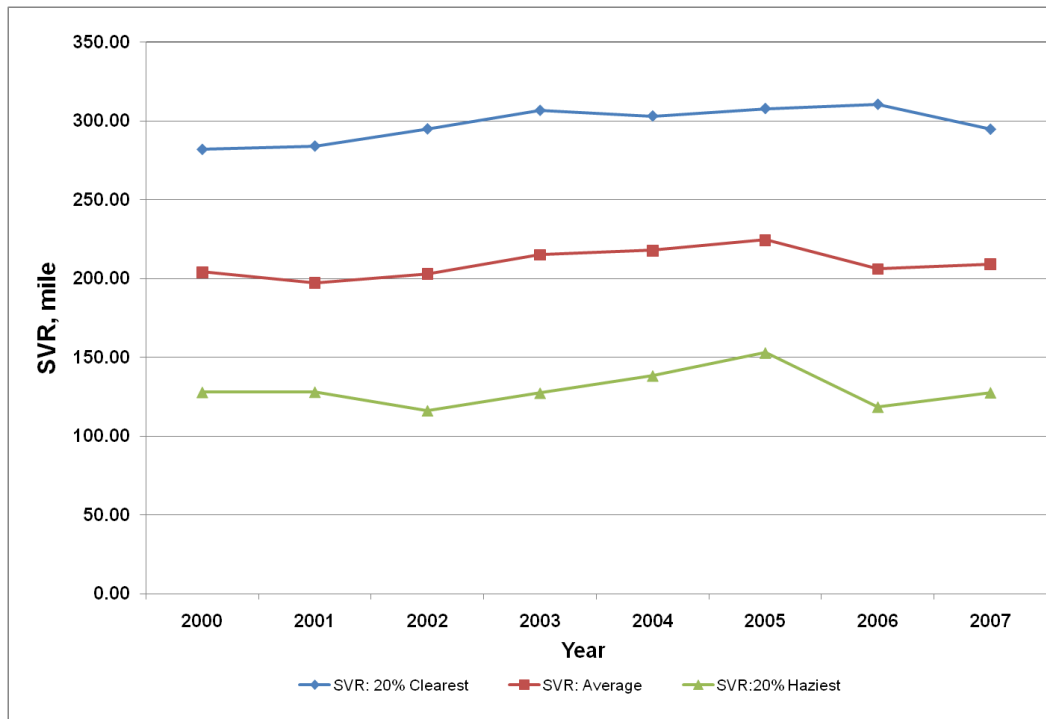
An environmental concern in the United States is the improvement and/or maintenance of visibility conditions, especially in national parks, recreation areas, wilderness areas, and national forests. There are several such areas in the vicinity of the planning area. The WRIR is within the Lander Field Office boundaries and although the WRIR has not yet chosen to identify itself as a PSD Class I area, it is considering doing so. A list of these areas, which are designated either Class I or Class II areas, is presented in Table 3.5, “Class I and Class II Areas in the Vicinity of the Planning Area” (p. 283).

Table 3.5. Class I and Class II Areas in the Vicinity of the Planning Area

Area Type	Area Name	Closest Distance to the Lander Planning Area (miles)	Direction from the Lander Planning Area	Clean Air Act Status of the Area
National Park	Grand Teton National Park	20	West	Class I
	Yellowstone National Park	25	West	Class I
Recreation Area	Bighorn Canyon National Recreation Area	90	North	Class II
Wilderness Area	Cloud Peak Wilderness Area	60	Northeast	Class II
	North Absaroka Wilderness Area	80	Northwest	Class I
	Washakie Wilderness Area	40	Northwest	Class I
	Fitzpatrick Wilderness Area	In	N/A	Class I
	Popo Agie Wilderness Area	In	N/A	Class II
	Bridger Wilderness Area	Adjacent	West	Class I
	Teton Wilderness Area	30	Northwest	Class II
National Forest	Bighorn National Forest	60	Northeast	Class II
	Thunder Basin National Grassland	90	East	Class II
Source: NPS 2006				
N/A Not Applicable				

Because there are no IMPROVE monitors in the Lander planning area, estimates of visibility in the area are primarily derived from air quality and meteorological measurements from the Bridger Wilderness IMPROVE monitor to the west in the adjacent Pinedale planning area and the North Absaroka IMPROVE monitor to the north in the Bighorn Basin planning area. This document includes data from these IMPROVE monitors to provide the most available data for visibility in areas close to the Lander planning area.

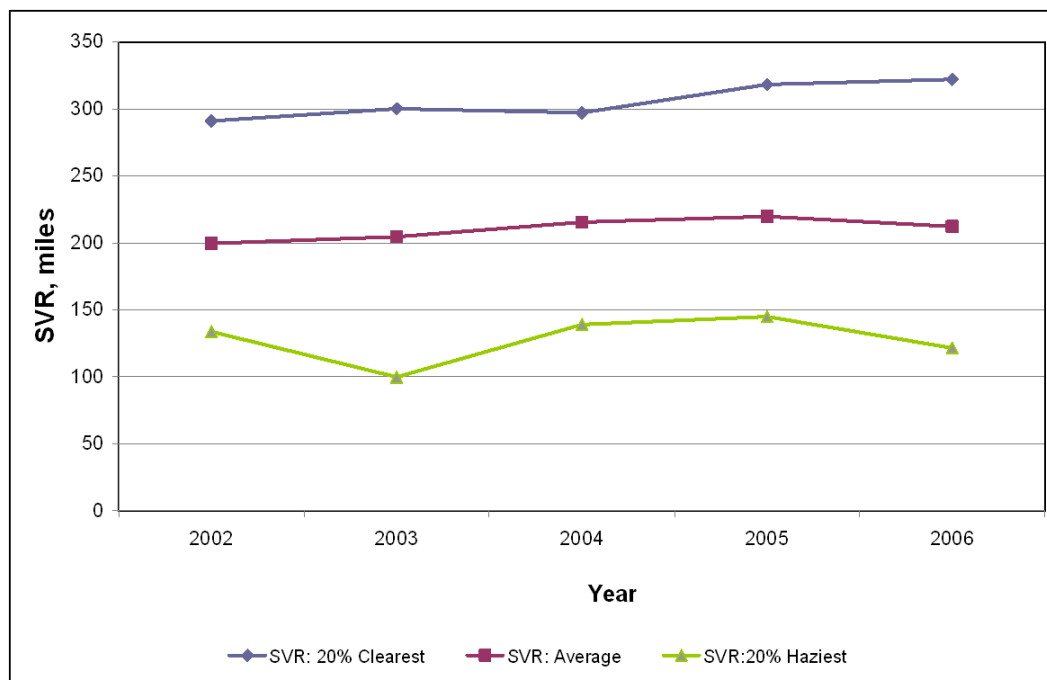
Figure 3.10, “Annual Visibility (SVR) at the Bridger Wilderness Wyoming IMPROVE Site” (p. 283) shows visibility estimates for the Bridger Wilderness IMPROVE site for the period 2000-2007. The data indicate excellent visibility conditions with no real trend in this period. Figure 3.11, “Annual Visibility (SVR) at the North Absaroka Wyoming IMPROVE Site” (p. 284) presents visibility estimates for the North Absaroka site for 2002 through 2006. These data also indicate excellent visibility conditions to the north of the area and no real trends in this limited period.



Source: IMPROVE Data 2009

IMPROVE Interagency Monitoring of Protected Visual Environments
 SVR Standard Visual Range

Figure 3.10. Annual Visibility (SVR) at the Bridger Wilderness Wyoming IMPROVE Site



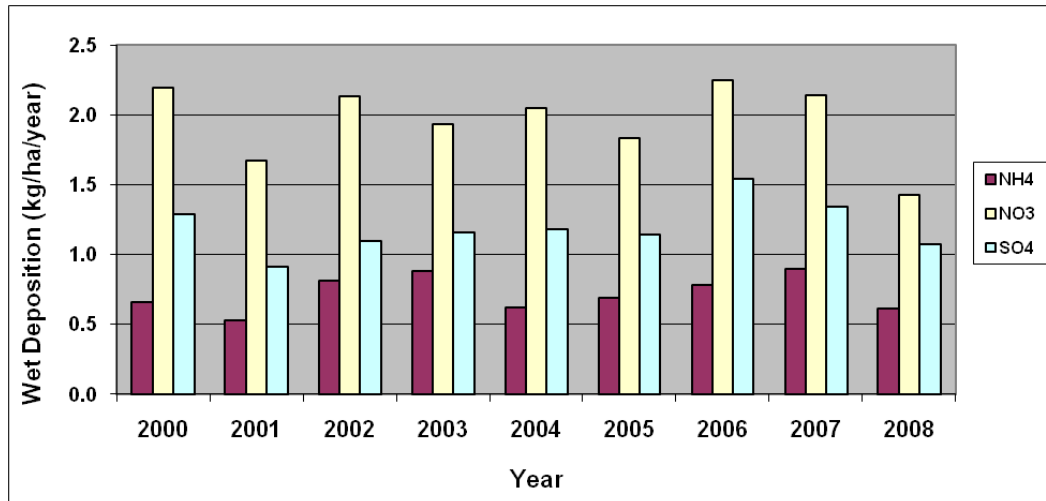
Source: IMPROVE Data 2009

IMPROVE Interagency Monitoring of Protected Visual Environments
SVR standard visual range

Figure 3.11. Annual Visibility (SVR) at the North Absaroka Wyoming IMPROVE Site

Atmospheric Deposition

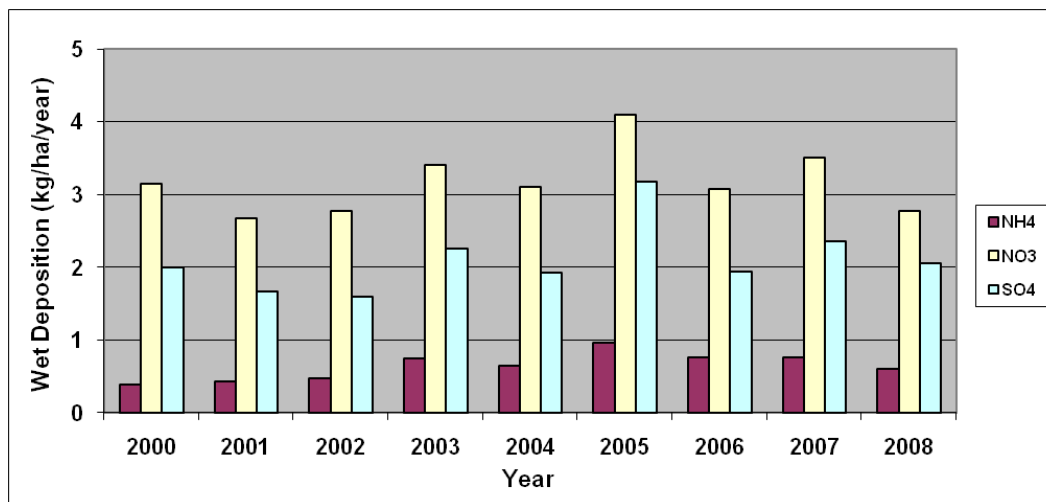
There are two NADP stations located within the planning area, one at Sinks Canyon and one at South Pass City. Figure 3.12, “Total Annual Wet Deposition (kilograms per hectare per year) at the Sinks Canyon Wyoming NADP Site” (p. 285) and Figure 3.13, “Total Annual Wet Deposition (kilograms per hectare per year) at the South Pass City Wyoming NADP Site” (p. 286) show total annual wet deposition for NH_4 , NO_3 , and SO_4 for 2000 through 2008 for the Sinks Canyon and South Pass sites. There are no discernable trends in these measurements over this period.



Source: NADP 2009

Kg/ha/year kilograms per hectare per year
 NADP National Acid Deposition Program
 NH₄ ammonium
 NO₃ nitrate
 SO₄ sulfate

Figure 3.12. Total Annual Wet Deposition (kilograms per hectare per year) at the Sinks Canyon Wyoming NADP Site



Source: NADP 2009

Kg/ha/year kilograms per hectare per year
 NADP National Acid Deposition Program
 NH₄ ammonium
 NO₃ nitrate
 SO₄ sulfate

Figure 3.13. Total Annual Wet Deposition (kilograms per hectare per year) at the South Pass City Wyoming NADP Site

Sources of Hazardous Air Pollutants (HAPs) and Criteria Pollutants

Existing sources of HAPs, criteria pollutants and Greenhouse Gases (GHGs) in the planning area include fossil-fuel combustion that emits HAPs; oil, gas, and coal development operations that emit VOCs; NO_x; and hydrogen sulfide (H₂S). In addition, large fires are a source of HAPs emissions. The growth in resource development and accompanying increases in emissions from these types of sources will depend on a number of external factors that make it difficult to estimate actual trends in concentrations of these pollutants in the planning area.

Summary of Air Quality Trends

Available air quality data for a number of criteria pollutants that were examined at various monitors in and near the planning area do not show any major upward or downward trends over the various periods of record. With only two years of available data at the South Pass site for PM₁₀, it is not possible to identify trends. Concentrations of PM_{2.5} at the Lander site show a relatively flat trend during the last four years of record (2005 through 2008). For the South Pass site, the fourth highest 8-hour average O₃ concentrations for 2007 and 2008 are below the national standard; however, it is not possible to identify trends using only two data points. Visibility data collected at the Bridger Wilderness site show very good to excellent visibility, even for the 20 percent haziest days. Wet deposition data for NH₄, NO₃, and SO₄ from the Sinks Canyon and South Pass City sites also show no distinct trend in deposition over the nine-year period of record (2000 through 2008) examined in this analysis.

Greenhouse Gases

Refer to the *Climate Change* section at the end of this chapter for information on historical and projected climate change in the planning area, potential impacts of climate change in the planning area, and activities in the planning area that may be contributing to climate change.

Management Challenges for Air Quality

Limited air quality data for the planning area makes it difficult to fully assess air quality conditions. Except for ozone, the limited monitoring data available from the few sites in the planning area and data collected at monitors in nearby areas reflect good to excellent air quality and visibility. With only 2 years of 8-hour ozone data at the South Pass site (2007 and 2008), it is not possible to calculate the design value, which is used to assess compliance with the NAAQS. The estimated design value for South Pass using the 2 available years of data is 68 ppb, which is below the current level of the standard (75 ppb). As part of EPA's normal 5-year cycle of reviewing air quality standards, in 2013 the EPA will be reviewing the current level of the 8-hour ozone standard and might reduce the standard below 75 ppb. If the EPA reduces the standard, the observed design value at that time, computed from measurement data taken in the planning area in 2011, 2012, and 2013, will be used to show compliance or non-compliance with the revised standard. One of the management challenges for the planning area is related to the accuracy of characterization of air quality conditions based only on limited data. Given this, continued maintenance of the applicable federal and state air quality standards is an issue. As additional resource development scenarios are considered for the planning area, it would be important to evaluate the impacts that emissions from development sources will have on criteria pollutants, visibility, and atmospheric deposition. The BLM expects to work cooperatively with the Wyoming DEQ, the EPA, and other federal agencies such as the National Park Service (NPS) and USFS to address these issues.

Additional challenges for the planning area will be to continue to characterize air quality conditions and track trends using limited monitoring data. Because of the limited data available to properly characterize air quality in the planning area, it would be prudent to establish additional monitoring sites throughout the planning area. Other challenges include developing effective rules and management actions aimed to maintain compliance with standards and improve air quality.

3.1.2. Geologic Resources

Regional Context

The planning area is in the regional geologic provinces of the Wyoming plains and the Rocky Mountains. Igneous, metamorphic, and sedimentary rocks of all geologic periods, except the Silurian, are present and represent a span from 3 billion years ago to the very recent – 10,000 years ago. The geologic setting consists of basins separated and surrounded by mountain ranges, including the Owl Creek, Washakie, Absaroka, Wind River, Granite, and Rattlesnake. Basins include most of the Wind River and the northern portion of the Great Divide Basin. Most of the planning area is in the Wind River Basin, with less than 150,000 acres in the Great Divide Basin.

The geologic setting contributes to the formation of numerous important geologic resources such as Red Canyon, Beaver Rim, Lander Slope and Table Mountain, Sweetwater Canyon, and Sweetwater Rocks. There also are unique geologic settings responsible for hosting certain mineral resource types and occurrences such as oil and gas, hard rock and placer gold, uranium, phosphate, and bentonite.

Several geologic features in the planning area are of special interest because of their unusual characteristics. These features include, but are not limited to the following:

- The Red Canyon Area approximately 24 miles south of Lander on Highway 28 offers one of the most accessible and dramatic examples of Laramide-age range-front structures in the Rocky Mountains. The canyon is an erosional feature, sited on the flank of the Wind River Range, which were uplifted during the Laramide Orogeny between 90 and 50 million years ago. Subsequent erosion and exposure beginning primarily in the Neogene (about 23 million years ago) and continuing to the present has created the landscape as viewed today.
- The Beaver Rim is a scenic feature that was formed by the continuing erosion and excavation of sediments from the Wind River Basin by the Wind River. This feature is geologically important because it represents an unusually complete sequence of Tertiary deposits that are exposed along the slopes of the rim. This sequence includes representative exposures of virtually complete Early Eocene Epoch (approximately 53 million years ago) through Middle Miocene Epoch (approximately 10 million years ago) stratigraphy. This nearly complete sequence is rarely exposed as a unit and is important to the understanding of Wyoming Tertiary geology. Its significance is increased by its proximity to U.S. Highway 287, where travelers can easily view the most intact section, which occurs near Green Cove.
- The Dubois Badlands area consists of approximately 4,903 acres of BLM-administered surface with badlands characterized by extensive erosion patterns and colorful soil banding, starting two miles north of Dubois and extending to the east.

Physiography

The planning area is generally contained within the boundary of the larger Wind River basin, a representative example of the numerous structural and sedimentary basins that formed in the Rocky Mountain region in response to Laramide-age tectonic activity (Keefer 1965). The Wind River Basin is also a physiographic basin, with drainage primarily out of the basin to the north and southeast and with most of the streamflow originating in the high country of the Wind River Range. Streams flowing out of the planning area actually contribute to two major drainages: the Missouri River drainage, which flows into the Gulf of Mexico, and much less significantly, the Snake River drainage, a tributary to the Columbia River system, which flows into the Pacific Ocean.

The major streams of the Missouri River drainage basin which drain the planning area include the Wind River system (Wind River, Little Wind River, north, south and middle forks of the Popo Agie River) and the Sweetwater River. The Wind River flows north out of the Wind River Basin and through the Owl Creek Mountains, where it is renamed the Bighorn River as it emerges from the north side of the canyon. The Bighorn River continues to flow north and eventually connects to the Yellowstone River, which is tributary to the Missouri River. The Sweetwater River drains the southern portion of the planning area from South Pass east to Pathfinder Reservoir, where it meets the North Platte River, a tributary to the Missouri River. Beaver Divide separates surface water that flows into the Wind River watershed from surface water that flows into the Sweetwater River watershed.

Near Dubois, Fish Creek drains approximately 30 square miles of the planning area to the west. The waters of Fish Creek flow to the Gros Ventre River, which in turn, makes confluence with the Snake River near Jackson, Wyoming. There is also a small portion of the planning area near a half-mile stretch of Wallace Creek in the Rattlesnake Hills that drains north to the Powder River Basin. The Powder River is a tributary to the Yellowstone River which drains to the Missouri River.

Structural Geology

The configuration of structural geologic features of the Wind River Basin that impact the nature and occurrence of mineral resources presently found in the planning area is closely controlled by events dating back to the Laramide orogeny. During the late Cretaceous Period, tectonic activity that represented the initial stages of the Laramide orogeny began in the form of down warping of the basin and broad doming of other areas peripheral to the basin (Keefer 1970). These structural events and those occurring during the bulk of the Laramide event exerted substantial influence on the style and pattern of sedimentation during all subsequent Tertiary time (Keefer 1965).

A major feature of the Laramide-age deformation is the Wind River uplift. This uplift is responsible for the Wind River Range and started as a large fold. As movement progressed, deformation continued as faulting where the upper crust acted as a rigid slab and the lower crust behaved more fluidly (Smithson et al. 1979). Predominately horizontal movement caused crustal shortening. This compression and resulting shortening along moderately dipping thrust faults can be related to plate movements during the Laramide orogeny (Brewer et al. 1980). The modern topographic Wind River Range resulted from the uplift and subsequent erosion of a doubly plunging, asymmetrical anticline cored by Archean-age crystalline rocks. The axis of this folded belt of rocks was breached by erosion, which exposed the crystalline core of the uplifted block, present at surface in the central part of the Wind River Range.

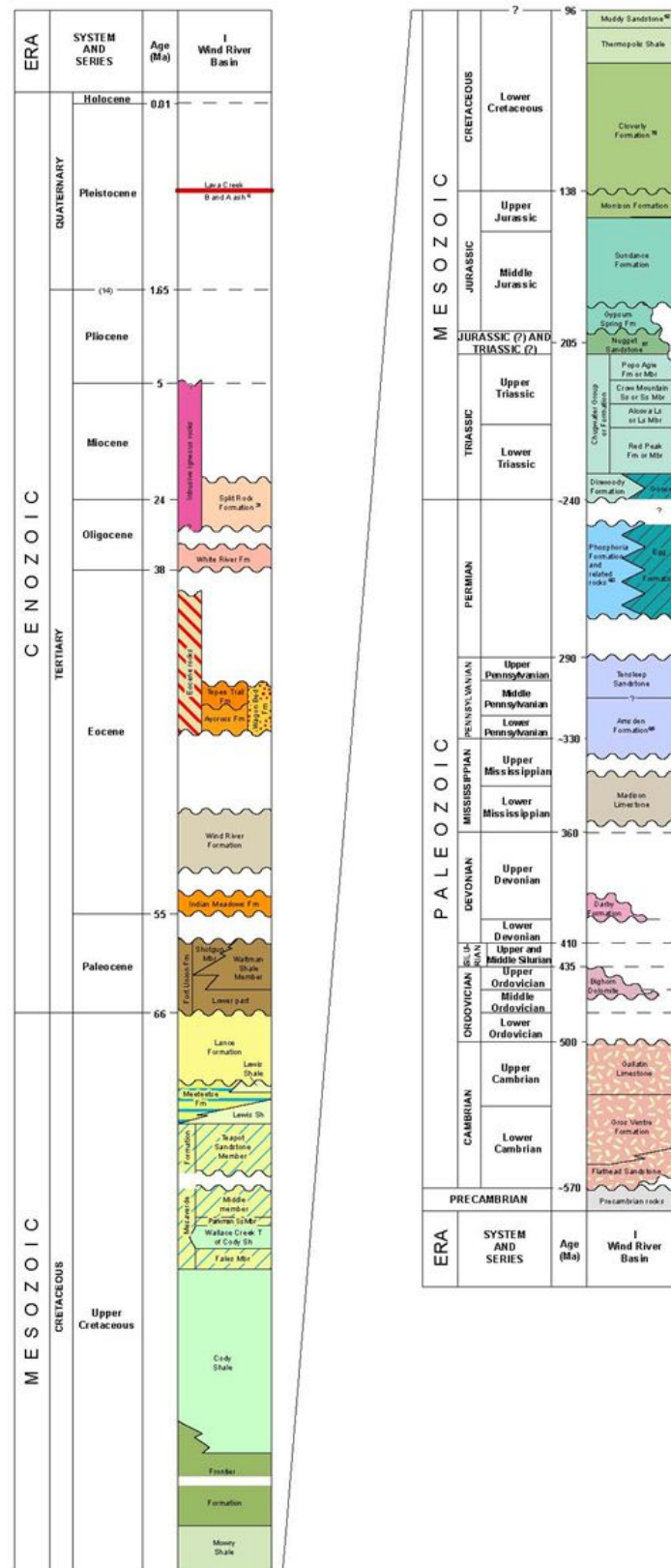
Parallel to and toward the center of the basin from the mountain uplifts there are many smaller structures such as the asymmetrical syncline in which the city of Lander is sited. On the west

margin of the basin, the Sheep Mountain anticline, Lander-Hudson anticline, Derby Dome, and Dallas Dome are examples of smaller anticlinal features from which oil and gas are produced. In fact, the first commercial oil well in Wyoming was at Dallas Dome on the western edge of the Wind River Basin approximately 8 miles south of Lander. Many structural features are unconformably covered with several hundred feet of younger, flat-lying sediments, generally of Tertiary age. Numerous faults of all variations are found in the planning area. Over-thrusting along major faults throughout the planning area represents good prospects for future oil and gas exploration.

Geologic Formations

Rocks can be roughly grouped into two main categories based on their presumed ages: the pre-Cambrian eon and the later Phanerozoic eon, which contains the eon corresponding to the present timeframe in the geologic timescale. Phanerozoic time began 542 million years before present (BP) and is the eon during which abundant vertebrate animal life has existed. This document employs the term pre-Cambrian to describe the age of all rocks originating before Phanerozoic time.

Rocks in the planning area range in age from pre-Cambrian to recent (see Figure 3.14, “Generalized Stratigraphic Column for the Planning Area” (p. 290)). Rocks from practically every Phanerozoic period except the Silurian (408 to 438 million years ago) are present in the planning area. Pre-Cambrian rocks generally consist of crystalline and metamorphic rocks exposed mostly in the core of uplifted areas, usually near the periphery of the basin, while Phanerozoic rocks include various kinds of sandstones, siltstones, carbonates, shales, and mudstones. In the Wind River Basin, the thickest accumulation of Phanerozoic sedimentary rocks is generally in the range of 20,000 to 30,000 feet. Tertiary-age sediments, generally of Eocene age, cover most of the central basin floor and in places abut crystalline rock exposures, as in the Granite Mountains area. Paleozoic and Mesozoic sedimentary rocks are exposed most often where structural conditions permit (for example, along mountain fronts, uplifts, and eroded canyons). For a more detailed description of the formations in the planning area, see the *Final Mineral Occurrence and Development Potential Report* (BLM 2009b).



Source: Love et al. 1993

Figure 3.14. Generalized Stratigraphic Column for the Planning Area

3.1.3. Soil

Soils in the planning area are highly variable. Soil characteristics can differ over relatively short distances, reflecting differences in parent material, position on the landscape, elevation, aspect, and local variation in precipitation and temperature.

Reconnaissance level soil surveys cover most of the planning area. These soil surveys include the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Cooperative Soil Surveys of Fremont County East and the Dubois Area Soil Survey of 1993; Natrona County Soil Survey of 1997; and Lander Area Soil Survey of 1981, which is in the process of being updated. There is no NRCS soil survey coverage for those portions of the planning area in Sweetwater and Carbon Counties.

General Description of Soils in the Planning Area

The planning area includes soils typical of cold, mountainous continental areas with arid, semi-arid, and sub-humid climates.

Soils in the arid, cold desert portions of the planning area can be found in the lowest parts of the Wind River Basin and in a second area known as the Great Divide Basin, most of which is in the Sweetwater County portion of the planning area. These soils receive the least annual precipitation, less than 10 inches and in some locations less than 5 inches. This area begins a few miles west of Dubois, follows the Wind River to Boysen Reservoir, and continues east to about Waltman in Natrona County. The northern boundary is the footslope of the Bridger Mountain Range and southern Big Horn Mountains, and the southern boundary is formed by the base of the Beaver Rim escarpment. Most of the badland, rock outcrop, and sand dune areas occur in arid areas. Topsoils in arid areas are thin and organic matter content is typically less than 1 percent in the surface horizon.

Soils in the semiarid portions of the planning area most commonly formed in mixed alluvium, primarily derived from sedimentary rock. The Split Rock Formation and the Wind River Formation are the source sedimentary rocks for much of this alluvium. The Amsden and Chugwater Formations, with their distinctive reddish sandstones, provide parent material for soils in certain locales such as scenic Sinks Canyon. There are also soils derived from granitic rock associated with the Louis Lake Batholith (Lewiston Lakes area), some of the upper slopes of the Wind River Mountains, as well as, the Bridger, Green, and Granite Mountains/Sweetwater Rocks and the Rattlesnake Hills. There are limited areas of badlands, rock outcrops, and sand dunes in the semiarid portions of the planning area. Topsoils in semiarid areas are thin and organic content is low, typically ranging from 1 to 2 percent in the surface horizon.

In both arid and semiarid environments, soils on stable land surfaces outside stream depositional areas commonly contain a horizon of clay accumulation immediately beneath the topsoil, underlain in turn by a zone of carbonate accumulation.

Arid and semiarid riparian-wetland soils are generally young and undeveloped, lacking developed subsoils, with similar organic matter levels in the topsoil as the upland soils. Some of the planning area's low swales, nivation hollows, and wet meadow/spring areas have developed soils with organic matter in the topsoil averaging from 2 to 5 percent.

Generally, soils above 8,000 feet in open meadows and areas where the climax vegetation is aspen have a thick topsoil horizon with high organic matter content, typically from 2 to 5 percent. These

soils occur on slopes ranging from nearly level to very steep. Coarse fragment content varies greatly. Soils above 8,000 feet range from well drained as in the dry meadows, to somewhat poorly drained as in some aspen stands, or poorly drained as in wet meadows.

Evergreen forested areas are typically composed of lodgepole pine, with minor amounts of Engelmann spruce and Douglas-fir found primarily in drainages. The thin topsoils that support forest commonly contain organic matter averaging from 1 to 4 percent, and soil drainage varies from well drained to poorly drained. Aspen is often a pioneer species that is transitional to a climax lodgepole pine community on these sites. Soil slope ranges from nearly level to very steep, and coarse fragment content can vary from none to being extremely (more than 60 percent by weight coarse fragments) gravelly, cobbly, stony, or bouldery. These mountain soils are found in areas that receive 15 or more inches of annual precipitation. Giant boulder conglomerate forms the parent material for the forest soils on the Green Mountains. Parent material for the mountain soils on the slopes of the Wind River Mountains is typically alluvium, colluvium, residuum, and glacial deposits most commonly derived from igneous granitic and mafic rocks, and metamorphic such as gneiss and schist. The parent material for soils of the higher foothills and low mountain slopes of the Wind River Mountains on the Lander Slope are formed largely in sedimentary rocks of the Phosphoria Formation, Madison Limestone, and Ten Sleep Sandstone. Topsoils are thicker here than those of forest soils but not as thick as the wet meadow/aspen pocket soils. These topsoils typically average from 2 to 4 percent in the surface horizon.

Resource Condition

There has not been a comprehensive survey of soil/site stability and health in the planning area. Published reconnaissance-level soil surveys do not routinely map or note eroded phases of soil series. The BLM does some limited soil health monitoring including proper functioning condition (PFC) inventories, project inspection reports, and analysis of reclamation success to release bonds. The BLM does perform qualitative soil assessments by evaluating livestock grazing allotment compliance with the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)). Standard 1 provides that, “Within the potential of the ecological site (soil type, landform, climate and geology), soils are stable and allow for water infiltration to provide for optimal plant growth and minimal surface runoff” (BLM 1997b). The BLM evaluates rangelands for compliance with Standard 1 by measuring appropriate indicators such as plant community composition and distribution in relation to infiltration and runoff; litter amount; functional/structural groups; plant mortality and decadence; vegetative annual production; invasive plants; soil compaction; erosion; and soil microorganisms. Standard 1 assessments provide the BLM with an overall picture of soil health for individual grazing allotments. Refer to the *Livestock Grazing Management* section of this chapter for additional information on the Wyoming Standards for Healthy Rangelands.

The existing condition of soil resources in the planning area varies greatly. There are still relatively undisturbed areas. These are typically areas livestock lightly use because of slope steepness or distance from water. Many of the soils types in the planning area are in good condition and capable of producing forage for wildlife and livestock, maintaining watershed integrity, and recovering from impacts associated with surface-disturbing activities. However, historic improper livestock grazing management, drought, extensive soil erosion, mineral development activities, rights-of-way (ROWs), off-highway vehicle (OHV) use and other recreational activities, timber harvesting, rangeland improvements, and other activities have affected localized areas in the planning area. Soil compaction resulting from surface-disturbing activities and associated development can reduce infiltration, increase runoff, and hamper reclamation. Reclamation of areas affected by surface disturbance can ensure that the Wyoming

Standards for Healthy Rangelands are met. In the planning area, there are mining exploration roads that have not been reclaimed, which could be contributing to continued soil impacts that lead to a failure in meeting Standard 2 of the Wyoming Standards for Healthy Rangelands.

Livestock grazing is a major source of soil compaction around range improvement projects in the planning area. Ninety-seven percent of the planning area is open to grazing, and areas of high-density grazing such as around water developments are subject to soil compaction. Typically, affected areas range in size from one-half acre to approximately 5 acres (University of Wyoming 2008). Heavy utilization of vegetation by livestock in riparian-wetland zones has also resulted in soil compaction in the nearby transition zones to the uplands, and in the formation of hummocks within the riparian-wetland zone. Studies have shown that soil compaction from grazing can have the effect of reducing water infiltration, thereby limiting the growth of rangeland vegetation (Castellano and Valone 2007).

One of the primary regional and national demands placed on soils in the planning area is mineral development and exploration. Well pad construction, road building, pipeline installation, and the discharge of produced water all have the potential to lead to soil degradation. The discharge of produced water can cause increased erosion and salinization. The Wyoming Pollutant Discharge Elimination System (WYPDES), operated by Wyoming DEQ, regulates the release of produced water, and imposes requirements for sediment control, spill containment planning, monitoring, and eventual reclamation of disturbed areas. In the last few years, the storm water discharge requirements have been imposed for most surface-disturbing activities that would affect one acre or more. Storm water discharge permit requirements have substantially reduced impacts from erosion from major surface-disturbing activities.

Other land uses, such as recreation and ROW development, also have the potential to affect soils. Motorized travel that does not follow travel management designations appears to be on the increase in certain areas in the planning area, including Government Draw and the Dubois Badlands. Increased interest in communication site ROW permits and renewable energy development also has the potential to lead to soil degradation. Conversely, timber harvesting activity is decreasing in the planning area due to decreased economic demand; therefore both short-term and long-term adverse impacts associated with this resource use have also decreased.

Invasive plant infestations in the planning area are expected to increase, which can alter soil health, although this depends on other factors such as soil disturbance and climatic conditions. Invasive plant infestations can force out native vegetation and replace it with weedy plants that provide inferior protection to the soil surface. Invasive plant species typically do not have root systems adequate to stabilize soils and sites dominated with invasive plants are often subject to accelerated erosion.

On a landscape scale, vegetation cover has undergone a net decrease in the last decade due to a prolonged drought. Vegetative cover is one of the most critical variables affecting soil erosion that land managers can control. Soil erosion accelerates substantially once a threshold of loss of healthy vegetative cover is exceeded. Generally, rangeland soils have thin topsoil and little organic matter, and are susceptible to accelerated erosion with a loss of vegetative cover. This can result in reduced fertility, invasive plant invasion, and excessive amounts of bare ground.

Wildland fires are increasing in size, intensity, and frequency. All indications are that this trend will continue. Larger fires lead to increased soil erosion and a shifting from native herbaceous communities to communities dominated by cheatgrass and annual invasive plant species. Species such as cheatgrass and Russian thistle are known to change the fire regime to favor a fire cycle

of more frequent and intense fires. If this trend continues, these plant communities would facilitate further soil loss.

Soil Erosion Potential

Soil landscape position, steepness of slope, physical properties (including texture and structure), and chemical properties contribute to susceptibility to wind and water erosion. Soils in the planning area with slight, moderate, and severe erosion potential have been identified where county soil survey data are available. On BLM-administered surface within the planning area, approximately 889,612 acres of soils have severe wind erosion potential and 1,229,683 acres have severe water erosion potential. Map 7 and Map 8 show wind and water erosion potential in the planning area; Table 3.6, “Soils with Slight, Moderate, and Severe Wind and Water Erosion Potential in the Planning Area” (p. 295) summarizes this information by land ownership. Maps 7 and 8 use the most restrictive rating for the soil component; for example, if a soil map unit contains 50 percent of a soil rated as slight for wind erosion and 35 percent of another soil rated as severe, the whole map unit is rated as severe. Thus, these maps provide only a general guide to soil erosion potential. Soil conditions for BLM-authorized activities must be considered on a site-specific basis.

Table 3.6. Soils with Slight, Moderate, and Severe Wind and Water Erosion Potential in the Planning Area

Erosion Type		BLM-administered Surface		Federal Mineral Estate		All Land Ownership	
		Acres	Percent of BLM-administered Surface	Acres	Percent of Federal Mineral Estate	Acres	Percent of Lands within Planning Area
Wind	Slight	171,202	7	199,879	7	239,132	7
	Moderate	648,789	27	769,984	27	1,394,641	42
	Severe	1,229,683	51	1,411,830	50	1,605,774	48
Water	Slight	585,804	24	702,894	25	876,634	26
	Moderate	565,770	24	661,391	24	770,738	23
	Severe	889,612	37	1,021,449	36	1,149,815	34
Source: BLM 2012a							
BLM Bureau of Land Management							

Management Challenges for Soils

Successful reclamation after surface-disturbing activities is a management challenge in the planning area based on regional factors such as climate and topography. Even with these constraints, most landscapes in the planning area can be reclaimed using locally established conventional reclamation methods. However, some areas have unique characteristics that make achieving reclamation requirements extremely difficult. These landscapes are defined as Limited Reclamation Potential (LRP) areas. LRP areas for this planning area are characterized by highly sensitive and/or erosive soils, with severe physical or chemical limitations, and landforms with steep slopes over 25 percent.

Limiting physical or chemical factors include soils that possess textures prone to excessive amounts of erosion by wind or water; high levels of salts that interfere with plant growth; soil textures with poor water holding capacity; coarse fragments that limit common rehabilitation

practices and equipment; soil profiles that limit water-holding capacity and/or create rooting-zone limitations; and soils with elevated levels of salts that interfere with plant growth.

Using these criteria, it is estimated that approximately 801,476 acres of the planning area result in LRP. The LRP areas have been identified on Map 11 to show the extent of these landforms and provide a better understanding of the impacts of surface-disturbing activities on these sensitive areas. Site-specific management of the LRP areas will be critical to evaluate and implement construction methods and reclamation and monitoring measures to achieve the greatest beneficial outcome. Reclamation success will be measured by the Reclamation Standards in Appendix D (p. 1477) for LRP areas.

Soil erosion potential was noted during the evaluation for each map unit but was not a determining factor used to identify LRP. Evaluating the soil and site characteristics that influence soil erosion factors were used instead. Potential soil erosion levels as identified in the surveys provide a general guide, but key soil and landform characteristics are the primary driver to determine LRP areas.

To make an LRP determination for each map unit, the BLM performed an initial assessment for physical and chemical limiting soil factors. This assessment identified map units of which at least 50 percent or greater of the total major soil series contain a soil characteristic that would limit the potential to reclaim a disturbed area. If a map unit met the minimal requirement, then it was considered, and additional evaluations were used to make a final determination.

This next evaluation looked at singular limitation versus multiple limitations. Map units with multiple limitations were automatically identified as LRP. Map units with a single limiting factor were identified as LRP only where the factor included more than 60 percent of the map unit and the factor was considered to be very limiting, such as highly saline or very shallow.

To determine the map units with slopes that exceed 25 percent, the initial criteria identified only the units where the entire slope for most of the soil series exceeded 25 percent. These were considered “steep” units, which is typically reflected in unit names.

To identify LRP map units with moderate to steep slopes, the BLM identified the high-end percentage in the slope ranges that exceeded 25 percent for most of the units. These map units generally have soil series that fall below 25 percent on the low end and exceed 25 percent on the high end. To better define these map units, the soil series were then evaluated for other soil physical and chemical limiting factors, such as shallow soils (less than 20 inches in depth to a root-restrictive layer) and/or high percentage of coarse fragments (boulder and/or cobble size). Only the map units that included both slopes in excess of 25 percent and soils with additional limiting factors were identified as LRP.

Singular landforms, such as rock outcrops, badlands, and dunes were also identified. These landforms usually prohibit surface-disturbing activities, so reclamation is not normally necessary. However, these landforms typically are surrounded by LRP soils, and as such were included to avoid “donut holes,” which could be misinterpreted.

Another factor that influences management challenges of soils is drought events, which lead to increased susceptibility to erosion. With arid and semiarid moisture regimes covering much of the planning area, minor changes in precipitation during winter and spring seasons can affect plant growth and seedling establishment. However, drought conditions that persist over consecutive

years can cause a reduction in plant cover and an increase in topsoil exposure to the elements. This results in accelerated soil loss and can lead to an irretrievable impact on soil fertility.

Major erosive events that often occur during and after droughts can be difficult to mitigate due to a lack of vegetative cover and loss of soil fertility. In the absence of plant cover, soils tend to dry hard and form a crust at the surface, which leads to reduced infiltration rates, surface runoff, and exposure to the abrasive effects of wind. In addition, reduction in the amount of plant cover reduces soil's ability to resist the dispersive action caused by water and wind processes. The result is detachment of soil particles and an increase in sediment transportation. Thus, runoff from average precipitation events or typical wind forces creates abnormal increases in soil loss and sediment transportation. This can perpetuate an increase in the frequency of flooding events and soil creep, which result in more soil erosion.

3.1.4. Water

This section characterizes surface water and groundwater resources and describes existing water use and water management practices in the planning area.

Surface Water

Watersheds in the planning area consist almost entirely of semiarid rangelands with small areas of alpine and high elevation forest. Because annual evaporation rates exceed annual precipitation, there is a water deficit on these rangelands. There are few perennial streams, and discharge from many streams is largely intermittent or ephemeral. Most of the precipitation is lost through evapotranspiration and sublimation instead of creating runoff or recharging groundwater aquifers (BLM 2009a).

There are two major hydrologic basins and one minor basin in the planning area (Map 4):

- The largest hydrologic basin in the planning area is the Wind River Basin, a subdivision of the Yellowstone River Basin, which is a subdivision of the Missouri River Basin.
- The second largest hydrologic basin is the North Platte River, of which the Sweetwater River is a tributary. This watershed covers most of the area on top of the Beaver Rim escarpment; it flows east to Pathfinder Reservoir on the North Platte River. A minor area in Natrona County drains directly to the North Platte River, which ultimately flows east to the Missouri River.
- The Great Divide Basin is a smaller hydrologic basin in the southern part of the planning area. This is a hydrologically closed basin in Wyoming's Red Desert region that does not drain to either the Pacific or the Atlantic Ocean.

In addition, a half-mile stretch of Wallace Creek in the Rattlesnake Hills drains to the Powder River, a tributary to the Yellowstone River, which flows to the Missouri River. Also, near Dubois, Fish Creek drains approximately 30 square miles of non-BLM-administered lands in the planning area to the west. Fish Creek flows to the Gros Ventre River, which meets the Snake River near Jackson; the Snake River flows to the Columbia River and into the Pacific Ocean.

Table 3.7, "Sub-basins in the Planning Area" (p. 298) summarizes the sub-basins and some of their associated water quality issues with information from the Wyoming DEQ 2006 305(b) report (Wyoming DEQ 2006).

Table 3.7. Sub-basins in the Planning Area

Sub-basin	Location	Uses	Status	Plan
Upper Wind Sub-basin (HUC-10080001)	Shoshone National Forest in the Dubois area.	Livestock grazing, irrigated agriculture, recreation, limited logging.	Fecal coliform; erosion; needed improvement for recreation and fishing; habitat degradation of Brooks Lake Creek.	Shoshone National Forest and DCCD have watershed improvement plans; DCCD will do further monitoring.
Little Wind Sub-basin (HUC 10080002)	Drainage into Little Wind River.	Livestock grazing, irrigated agriculture, oil and gas.	Degradation along Beaver Creek and fecal coliform.	Wyoming DEQ is monitoring; BLM data shows improvement.
Popo Agie Sub-basin (HUC 10080003)	Headwaters in Shoshone National Forest.	Agriculture (96% of use), livestock grazing, recreation, residential. Lander municipal water source.	Fecal coliform (livestock grazing, septic systems).	Popo Agie Conservation District has a watershed plan to identify pollution sources and remedy. Squaw and Baldwin Creek drainage rehabilitation successful.
Muskrat Creek Sub-basin (HUC 10080004)	South Gas Hills east of Riverton.	Livestock grazing, oil and gas, uranium.	AML remediation.	Lower Wind River Conservation District has established a monitoring location and plan.
Lower Wind Sub-basin (HUC 10080005)	Wing shaped with Muddy and Fivemile Creeks on the west side of Boysen Reservoir and Poison Creek on east.	Livestock grazing, oil and gas.	Fecal coliform.	Lower Wind River Conservation District has submitted data to Wyoming DEQ and is awaiting a plan.
Badwater Creek Sub-basin (HUC 10080006)	Northeast side of Boysen Reservoir.	Livestock grazing and oil and gas in Lysite/Lost Cabin area.	AML remediation; limited water data.	It appears that large amounts of sediment are transported to Boysen during runoff events.
Nowood Sub-basin (HUC 10080008)	Headwaters are on southwestern side of the Big Horn Mountains.	Livestock grazing, irrigated agriculture and oil and gas. Small amount of bentonite.	Fecal coliform, including untreated human sewage.	Washakie County Conservation District is monitoring and remediating. South Big Horn Conservation District is monitoring Paintrock Creek.
Sweetwater Sub-basin (HUC 10180006)	Headwaters in the South Pass area draining to the Platte.	Livestock grazing, irrigated hay, mining including uranium, oil and gas and recreation.	More than 100 AML sites have been remediated; more remain. Mercury in Willow Creek, oil in Crooks Creek.	Additional monitoring and TMDLs.
South Fork Powder Sub-basin (HUC 10090203)	Natrona County, extending to the Waltman area.	Grazing and oil and gas (and possibly other minerals).	BLM manages less than 300 acres in this basin.	-

Sub-basin	Location	Uses	Status	Plan
Great Divide Basin (HUC 10)	Red Desert in south of planning area.	Mostly intermittent and ephemeral reaches.	None identified.	Impacts from uranium and oil and gas need to be considered.
Sources: Wyoming DEQ 2006; DCCD 2004; Lower Wind River Conservation District 2010; BLM 2009a				
AML Abandoned Mine Land				
BLM Bureau of Land Management				
DCCD Dubois-Crowheart Conservation District				
DEQ Department of Environmental Quality				
HUC Hydrologic Unit Code				
TMDL Total Maximum Daily Load				

Reductions in annual streamflow throughout the planning area due to drought have affected water quality parameters such as water temperature, total dissolved solids (TDS), dissolved oxygen, and other factors. As precipitation patterns change (below normal snowfall, earlier snow melts, substantial losses from sublimation before melting, etc.) and as glaciers in the Wind River Mountains recede, annual spring runoff would occur sooner and have smaller discharges. This would result in lower, or in some cases no, natural flows in late spring, summer, and fall (Rice et al. 2012). Lower levels of water could result in degradation of water quality, including warming, loss of high flows needed to flush pollutants, and degradation or loss of habitats. Reductions in runoff also impact water use for summer irrigation in the planning area. These water quantity and quality impacts reflect potential impacts of climate change in the planning area. Refer to the *Climate Change* section at the end of this chapter for additional information on climate change.

Water Quality

Water quality is strongly influenced by geology and terrain. Natural water quality characteristics of streams coming off the Wind River Range are generally good, but because natural erosion and stream processes increase sediment and TDS loads, water quality can change as streams flow across the basin. Accelerated erosion, runoff from irrigated agriculture, produced water discharge from oil and gas development, and discharges from other human activities have the potential to further degrade water quality (Colby et al. 1956, USGS 1999).

Erosion occurs naturally in many places in the planning area. Particularly in soils with little stabilizing vegetation as is common in many areas, bank erosion and gullyng naturally occurs without human-caused disturbance. Many watersheds in Wyoming, including throughout the Wind River Basin, naturally contribute extremely high sediment loads to the watersheds. This is demonstrated by the sediment transport of creeks and rivers during spring runoff and after substantial precipitation events. The BLM lacks the ability to quantify the amount of natural erosion and sedimentation. However, given the amount of surface disturbance associated with BLM-authorized activities compared to the extensive area over which natural erosion occurs, it is likely that these natural events contribute much more erosion and soil transport than activities associated with energy development. Modeling of likely erosion associated with energy development, as BLM applies this requirement as part of site-specific analysis, could provide additional information.

The Sweetwater Sub-basin headwaters are in the South Pass area of the southern Wind River Mountains. Land uses in this sub-basin include grazing, irrigated hay production, and mineral development.

Natural processes and human actions influence the chemical, physical, and biological characteristics of water. Indicators of water quality include:

- Chemical characteristics (e.g., pH, conductivity, dissolved oxygen)
- Physical characteristics (e.g., sediment, temperature, color)
- Biological characteristics (e.g., macro- and micro-invertebrates, fecal coliform, and plant and animal species)

The Wyoming DEQ, in compliance with the federal Clean Water Act (33 United States Code [U.S.C.] 1215 et seq.), requires that water quality be maintained or improved for outstanding (Class 1) and most of the high-quality (Class 2) waters. All other waters must be maintained against degradation and are assessed by Wyoming DEQ to determine if water quality meets the requirements for the class into which Wyoming has assigned the waterbody. For example, Class 2AB waters support game fish (Wyoming DEQ 2008a). Water quality is evaluated to see if it supports the use identified for that class of water. Meeting this “use support” is an indicator of water quality.

The Sweetwater River is the only waterbody Wyoming DEQ classifies as a Class 1 water quality stream that flows through BLM-administered public lands in the planning area. This designation begins at the Sweetwater River’s confluence with Alkali Creek south of Sweetwater Station, and proceeds upstream to its source on the western slope of the southern Wind River Mountains.

Point source and nonpoint source pollution affect water quality. Point source pollution is conveyed from a discrete location such as a pipe, tank, pit, or ditch. Discharge of produced water, which contains high levels of salt, can cause water quality problems and soil salinization from the deposition of salts. Nonpoint source pollution is from a diffuse source, such as runoff from cultivated fields or grazed land. Section 502(14) of the Clean Water Act defines any source of water pollution that does not meet the legal definition of “point source.” Nationally, agricultural nonpoint source pollution is the leading source of water quality impacts to surveyed rivers and lakes, and is a major contributor to groundwater contamination and wetlands degradation (EPA 2005). Polluted runoff is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into watersheds through lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water. Of the three waters identified in the planning area as requiring management (discussed in the next paragraph), two are for fecal coliform from nonpoint source pollution and one is for oil and grease with an unknown origin.

Clean Water Act Section 305(b) requires a biennial report from the state that presents a summary of water quality conditions. This report includes the Clean Water Act Section 303(d) List, which identifies waters of the state that have been found to have impaired water quality and require a total maximum daily load (TMDL) allocation. Table 3.8, “Waters Requiring TMDLs on BLM-Administered Land in the Planning Area” (p. 301) lists the waters in the planning area requiring TMDLs.

Table 3.8. Waters Requiring TMDLs on BLM-Administered Land in the Planning Area

Waterbody Name	Location	Use Not Supported	Cause of Impairment
Popo Agie Middle Fork (TMDL Date – 2010)	Undetermined distances upstream and 4 miles downstream of Lander.	Recreation	Fecal coliform
Poison Creek (TMDL Date Priority – Low) This rating indicates TMDLs will not be completed within the next four years.	From Boysen Reservoir upstream an undetermined distance.	Recreation	Fecal coliform
Crooks Creek (TMDL Date – 2008)	From T28N, R92W Sec. 18 SWNE undetermined distance downstream.	Aquatic life, cold-water fish	Oil and grease
Source: Wyoming DEQ 2006 E East N North R Range		S South T Township TMDL Total Maximum Daily Load W West	

The goal of the development and application of the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)) is to achieve the four fundamentals of rangeland health: 1) watersheds are functioning properly, 2) water, nutrients, and energy are cycling properly, 3) water quality meets state standards, and 4) habitat for special status species is protected. As identified in the fundamentals above, water is an important factor in meeting rangeland health. Standard 5 identifies the BLM's role in complying with all federal, state and other applicable regulations regarding water quality and clarifies that the State of Wyoming administers the Clean Water Act (with the EPA administering the Clean Water Act on the WRIR). Standard 5 recognizes the impacts of natural processes and human actions on water quality and the variations in water quality based on seasons, climate, and the substrate through which water moves. Wyoming BLM evaluates rangelands for compliance with Standard 5 as per guidance given in Wyoming Instruction Memorandum (IM) WY-98-061 that outlines a determination process. This process requires consulting the Wyoming DEQ's impaired waterbody list, also called the 303(d) list after that part of the 1977 Clean Water Act. Also, if a stream is delisted that too is noted, as now it has been demonstrated to meet state, and federal, water quality standards. For all other waterbodies Standard 5 is considered to be "Unknown" and all available information such as PFC inventory, fisheries inventory, and other agency data are consulted to determine if there might be suspected water quality impairments that we must bring to the attention of the Wyoming DEQ for them to include such waterbodies in their scheduled monitoring. Refer to the *Livestock Grazing Management* section of this chapter for additional information on the Wyoming Standards for Healthy Rangelands.

Surface Water Trends

The sub-basin summaries in Table 3.7, "Sub-basins in the Planning Area" (p. 298) provide trend information where it is available. In general, as water levels have dropped due to the drought this decade, such parameters as water temperature, TDS, dissolved oxygen, and other factors have typically become unfavorable to supporting the designated biological and recreational uses assigned. Drought impacts, whenever they occur, will be considered as BLM authorizes activities by specifying specific project design features including appropriate WYPDES

Stormwater Discharge Permitting, Pollution Prevention Plans, and best management practice (BMP) application; stipulations; mitigation; and through the remediation of known water quality impairments. BLM will protect, maintain, or enhance water quality and quantity as necessary to the mission of our agency and to comply with federal and state statutes.

Cities such as Lander that rely on surface water for a substantial percentage of domestic water also face increasing water demands that correspond to increases in local urban populations and industrial development. The fastest growing population segment locally is that of the small acreage (2 to 40 acres) rural ranchette, or ex-urban, landowner. The development of subdivisions on former ranch land, especially in the Dubois area and on the Lander Slope, is at historically high levels. Small subdivision water systems, cisterns, and individual wells supply domestic water in these areas.

Because the major consumer of water is irrigated agriculture on privately owned lands, population increase is not expected to be a major factor in changing water usage. The BLM does not authorize irrigated agriculture use of public lands in the planning area. Trends in irrigated agriculture are generally limited to the water rights attached to property or those perfected through the current state process. Surface water is the source for the majority of irrigated acres. Annual agricultural water supplies can be highly variable if local streams are the sources of water.

Water quality is expected to decrease due to increased development of all types. Development almost always results in soil disturbance, which can cause erosion and loss of fertility necessary to sustain vegetative cover. As invasive species become established and outcompete native vegetation, water infiltration into the soil is reduced.

The term "point source" means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture (EPA 2012b).

Point source discharge can contribute to erosion even where a WYPDES permit is in place. Oil and Gas Onshore Order No. 7 identifies re-injection as the preferred method of disposal of produced water; however, this is not always technically feasible. An appropriate receiving formation that has the same or lower quality as the produced water is required, and the amount of transporting pipe and/or roads needs to be evaluated.

Adverse impacts to soil and vegetation resources are likely to result in reduced water quality. Maintaining proper vegetative cover and sustaining healthy root systems optimizes a soil's water infiltration capability. Improved water disposal, riparian-wetland exclosures, aggressive reclamation activities, diligent compliance with Wyoming DEQ storm water permitting requirements, and grazing systems designed for light use and the incorporation of rest help to mitigate adverse impacts to water quality, as would mitigation projects that improve riparian-wetlands degraded by earlier activities.

Early in the management of BLM-administered lands, riparian-wetland areas were not valued for their non-agricultural and non-industrial values. Prior to the 1980s year-long and season-long grazing systems, that allow livestock to spend a maximum amount of time loitering in riparian-wetland areas, were common in the planning area. However, with increased knowledge of the value of riparian-wetland areas for other uses, such grazing systems were revised in favor of rotation systems that allow for rest for at least part of the year and shift livestock use to different

time periods from one year to the next to improve plant health. In some cases riparian-wetland pastures, exclosures, and spring source protection fencing has been created to more rapidly restore specific areas. There are still many season-long grazing systems in the planning area, and riparian-wetland areas in these grazing allotments still exhibit impacts expected of continuous grazing pressure. The Lander Field Office continues to revise the grazing management in these areas in an effort to facilitate riparian-wetland recovery and achieve PFC, and meet the Wyoming Standards for Healthy Rangelands. Generally speaking, riparian-wetland water quality and quantity trends have improved in many locations since the riparian initiatives that began in the early 1980s.

Inflows to the major reservoirs at the planning area boundaries are gauges of the impact from drought conditions beginning in 1999 to 2000. The harvest of water from the Wind River watershed at Boysen Dam can be used to index the capabilities and ultimate outputs from the BLM-administered public lands in this basin. Table 3.9, “Comparison of Historical and Recent Inflow at Boysen Reservoir” (p. 303) compares the historic data with data from 2000 to 2006. As shown, water supply downstream and power generation at Boysen Dam were reduced to nearly one-half of previous years.

Other waters in the planning area have been identified as having elevated nonpoint source pollution, but the management of these waters is being handled through the local conservation districts, which work with ranchers and homeowners with septic systems to reduce *E. coli* contamination.

Table 3.9. Comparison of Historical and Recent Inflow at Boysen Reservoir

Period	Average Inflow (acre feet)
1970-1999	1,094,100
2000-2006	570,500
Source: BOR 2007	

The reduction by almost 47 percent is similar to the reduction in flow as measured on the Sweetwater River, as shown in Table 3.10, “Comparison of Historical and Recent Flows in the Sweetwater River” (p. 303). In 2001, mean monthly flows from May to September decreased by approximately 90 percent and decreased by approximately 64 percent from June to September.

Table 3.10. Comparison of Historical and Recent Flows in the Sweetwater River

Period	Mean Annual Flow Measures (cubic feet per second)		
	Peak Maximum Flow (May)	Peak Maximum Flow (June)	Minimum Flow (September)
1914-2001	413	391	29.8
2001	133	36.5	13.1
Source: USGS 2001			

Impacts to water quantity are primarily a function of agricultural use, which accounts for 97 percent of usage, and not population size. Fremont County had a substantial population decrease from a high in 1980. Since 1990, however, population has grown steadily, almost reaching the 1980 level by 2006. While this population increase has affected domestic water usage, it has little effect on overall water use. All irrigation water rights have been allocated.

In general, as water levels have dropped due to the drought this decade, such parameters as water temperature, TDS, and dissolved oxygen typically become unfavorable for supporting the designated biological and recreational uses assigned.

Groundwater

An aquifer is defined as a groundwater resource contained in the pore space of geologic media in such quality and quantity that it may be readily available for use via springs or wells. The United States can be divided into numerous groundwater provinces (regions) (Meinzer 1923, McGuinness 1963); the planning area is in the Unglaciaded Central Region. This region encompasses a large area of the interior United States and is generally underlain by level or gently tilted and folded sedimentary rocks ranging in age from Paleozoic to middle Tertiary (Fetter 1980). Groundwater resources in the planning area primarily occur in unconsolidated deposits of Quaternary age consisting of floodplain alluvium; the Tertiary Wind River Formation; and older Mesozoic, Paleozoic, and Precambrian rocks (Plafcan et al. 1995).

The Wind River Formation is the most extensive water-bearing unit occurring at land surface and contains groundwater under both unconfined and artesian conditions (Plafcan et al. 1995). In the older Mesozoic and Paleozoic rocks, aquifers can be present where sufficient permeability is present, for example, in porous sandstones or fractured carbonate rocks. These groundwater-bearing units yield water under confined conditions, except where such water-bearing zones intersect the land surface along outcrops or faults.

Confining units within the Wind River Formation include numerous siltstones and thick shales and mudstones. There is also unconfined groundwater in water table aquifers such as those in alluvium and windblown sand deposits (Whitcomb and Lowry 1968) and in the aforementioned outcrop areas of otherwise confined aquifers.

Geologic units in Fremont County are recharged by one or a combination of the following sources: (1) precipitation that infiltrates the geologic unit in its outcrop area, (2) infiltration of surface water, (3) infiltration of irrigation water, and (4) leakage from another geologic unit either from above or below (Plafcan et al. 1995). Almost all geologic units are recharged to some degree by precipitation (Plafcan et al. 1995).

Uses of groundwater in the planning area include public supply (municipal), domestic, commercial (thermoelectric), industrial (including mining), irrigation, and agricultural.

Surficial Unconsolidated Aquifers

Surficial unconsolidated aquifers generally consist of glacial, stream, and terrace sediments (alluvium) along floodplains of rivers and streams and surficial windblown sand deposits. Recharge to shallower aquifers occurs through direct infiltration (rainfall, snowmelt, irrigation) and leakage through adjacent water-bearing zones. Discharge occurs through springs, baseflow contributions to streams and rivers, and withdrawal through shallow wells. The surficial unconsolidated aquifer system is the second most developed aquifer system in the planning area (ranking behind the Wind River Formation), although its occurrence is limited to areas near streams and is therefore disconnected areally (Plafcan et al. 1995).

Table 3.11, "Uppermost Unconsolidated Water-Bearing Formations and their Characteristics" (p. 305) lists the characteristics of surficial unconsolidated aquifers in the planning area. The alluvial deposits are represented mainly by the Wind River, Popo Agie, and Sweetwater Rivers and their tributaries.

Table 3.11. Uppermost Unconsolidated Water-Bearing Formations and their Characteristics

Description/Formation	Lithology and Distribution	Aquifer Characteristics
Alluvial deposits	0 to 65 feet thick, unconsolidated sand, clay, and gravel. Includes terrace, floodplain, and pediment deposits along major streams.	Yields small to large supplies of water to wells where deposits are porous and permeable. Water quality is susceptible to impacts (such as high salinity) caused by agricultural practices (livestock and irrigation).
Windblown sand	Present in northeastern part of the planning area, consisting of a 0- to 40-foot thickness of unconsolidated fine to very fine sand.	Yields small supplies of water suitable for stock or domestic use. It is considered an important source of water in areas underlain by Cody Shale.

Source: Whitcomb and Lowry 1968

Windblown sand deposits are primarily present between Riverton and Moneta, along Poison and Muskrat Creeks, where they are an important source of small quantities of groundwater (Whitcomb and Lowry 1968). While yields are small, the water quality is good because it is derived mainly from local precipitation. One spring in this area that issued from dune sand and loess was inventoried on August 1991 with a measured discharge of 28 gallons per minute, which is adequate for domestic or stock supplies (Plafcan et al. 1995).

Water Quality in Surficial and Shallow Unconsolidated Aquifers

Water quality in surficial alluvial aquifers can differ markedly compared to other types of groundwater systems, depending on the source and amount of recharge, the composition of the porous medium, and man-made factors present in the area. Water quality also commonly fluctuates seasonally in alluvial aquifers due to the amount of influence from direct precipitation and runoff. It should also be noted that surficial unconsolidated aquifers are most at risk for degradation from the cumulative impacts of domestic, industrial, agricultural, stock-raising, and storm-water disposal practices, all of which affect water quality to some degree.

Water quality data for the surficial unconsolidated aquifers are limited; the most recent data available were collected in 1995 (Plafcan et al. 1995). These data were obtained from 47 wells completed in Quaternary deposits throughout Fremont County. Thirty-three of the wells sampled were completed in alluvium and colluvium; 10 were completed in terrace deposits; and four were completed in glacial, landslide, or eolian sand deposits. Samples obtained from shallow unconsolidated aquifers represented by Quaternary-age alluvium, colluvium, terrace deposits, glacial deposits, and dune sand and loess deposits had water quality parameters mostly within acceptable limits and no samples had detectable quantities of selected pesticides (Plafcan et al. 1995). Groundwater from alluvial and colluvial deposits in Fremont County has TDS ranging from 141 to 1,430 micrograms per liter (mg/L) and dissolved-solids concentrations from 10 water samples from terrace deposits ranged from 293 to 1,670 mg/L. For comparison, the EPA secondary maximum contaminant level for dissolved-solids concentrations in drinking water supplies is 500 mg/L. Generally, concentrations of TDS are lower in the upstream floodplain deposits than in the deposits farther downstream. Most of the groundwater samples are classified as calcium-carbonate type waters in upper reaches of the floodplain and change to sodium-calcium carbonate-sulfate type waters with moderate to very high hardness farther downstream.

Studies done by Bartos and others (Bartos et al. 2008) demonstrated the impact that land use has on the quality of shallow groundwater in unsewered areas of low-density development and

focused on three areas in the intermountain west, one of which was near Lander. Results of the study are specific to the Lander area, but can be extrapolated to areas with similar hydrogeology in the planning area. Ten wells were installed in two general areas, one north of Lander along the floodplain of the North Fork of the Popo Agie River and the other along the floodplain of the Middle Fork of the Popo Agie River between Sinks Canyon and the city of Lander. Land use and land cover in the North Fork area generally consist of wetlands, pasture/hay, and occasional row crops; land use and land cover along the Middle Fork area consists of shrubland/grassland, forested land, wetlands, pasture/hay, and occasional crops. Water levels in these areas ranged from less than 1 foot to almost 7 feet below land surface. Recharge to shallow groundwater is not only from areal infiltration but also from infiltration of unlined irrigation canals and ditches; water applied to cropland, hayfields and gardens; and leakage from domestic septic systems.

While impacts of human activities on the quality of shallow groundwater were indicated in the planning area, shallow groundwater is suitable for most uses without treatment, and impacts (groundwater contamination) from human activities generally were minimal and limited in areal extent at the time of sampling (Bartos et al. 2008).

Synthetic organic pesticides are used to control weeds, insects, and other organisms in a wide variety of agricultural and nonagricultural settings. Pesticide use, however, has also been accompanied by concerns about potential adverse impacts on the environment and human health. A potential pathway for the transport of pesticides is through hydrologic systems, which supply water for both humans and natural ecosystems. Water is one of the primary ways pesticides are transported from an application area to other locations in the environment (USGS et al. 2000).

In 1991, members of local, state, and federal governments, as well as industry and interest groups, formed the Groundwater and Pesticide Strategy Committee to prepare the State of Wyoming's Generic Management Plan for Pesticides in Groundwater. Part of this management plan is to sample and analyze Wyoming's groundwater for pesticides. In 1995, the U.S. Geological Survey (USGS), in cooperation with the Groundwater and Pesticide Strategy Committee, began statewide implementation of the sampling component of the State of Wyoming's Generic Management Plan for Pesticides in Groundwater. In 1998, baseline monitoring began in Fremont County.

Fremont County was determined to be fourth most vulnerable in the State of Wyoming to pesticide contamination. The vulnerability map used by the USGS (USGS et al. 2000) identified high vulnerability on the WRIR and the lands managed by the Bureau of Reclamation in the Pavillon area. BLM-administered lands were generally medium low to medium high, with a smaller area low vulnerability.

To evaluate pesticide contamination in Fremont County, 20 sites were tested for baseline monitoring (USGS et al. 2000). None were BLM-administered lands; most were on the WRIR. The USGS characterized the results as follows: "Six of the 18 focal pesticides and 1 non-focal pesticide were detected in Fremont County. At least one pesticide was detected in 13 of the 20 wells sampled in Fremont County. All detected concentrations of pesticides were less than the drinking water standards" (USGS et al. 2000). The pesticide found in 13 of the wells was atrazine, an agricultural herbicide typically used for weed control in corn and other crops.

Lands rated as being most sensitive to contamination are generally on alluvial deposits adjacent to rivers, streams, and lakes; on slope wash, colluvium, residuum, and eolian deposits; and on fractured bedrock areas (Stacey and Lindstone 2003). In the planning area, municipal water sources for the City of Lander are located in the fractured bedrock areas on the slopes of the Shoshone National Forest and BLM-administered lands in the Sinks Canyon area, as well as in

the Beaver Creek area and other primarily isolated parts of the planning area. Some of the highest aquifer vulnerability areas on BLM-administered lands are in the watershed of the municipal water source for the City of Lander.

Upper Regional Aquifer System

The uppermost hydrologic unit is represented by aquifers contained in Tertiary-age sediments (e.g., the Wind River Formation) through uppermost Cretaceous rocks (e.g., Lance Formation) or equivalents where present. Table 3.12, “Description of Water-Bearing Formations in the Uppermost Regional Hydrologic Unit” (p. 309) lists characteristics of water-bearing formations that can be included in the uppermost hydrologic unit (Whitcomb and Lowry 1968; Arneson et al. 1998).

Regional Hydrologic Units

There are three regional hydrologic units through the majority of the planning area (Arneson et al. 1998). Hydrologic units are regional stratigraphically adjacent formations with similar hydraulic properties and recharge/discharge characteristics. They can function as regional aquifer systems or regional aquitards, even while they might be lithologically dissimilar. Recharge to shallow hydrologic units occurs over large areas in response to direct infiltration or leakage from adjacent water-bearing zones; recharge to deeper units is often substantial where mountain uplift has exposed the units on the margins of the Wind River Basin, or where geologic structures are present (e.g., Rogers Mountain Anticline, Dutton Anticline, and Rattlesnake Hills Anticline).

Principal among these water-bearing units in terms of exploitation are the Wind River Formation throughout the upper two thirds of the planning area and the Split Rock Formation aquifer system (also known as Arikaree) in the southern third of the planning area. The Split Rock Formation contains water under mostly unconfined (water table) conditions, with depth to water governed by topography (Whitcomb and Lowry 1968). Past studies have indicated well depths ranging from 65 to 1,080 feet below land surface. Depth to water data collected for a study released in 1968 indicated a range of 12 to 220 feet below land surface (Whitcomb and Lowry 1968), while more recent data indicate water levels ranging from 24 to 94 feet below land surface (Plafcan et al. 1995).

The largest number of water well completions in the uppermost regional hydrologic unit is in the Wind River Formation, making it an important source of groundwater and the most areally extensive water-bearing surficial formation in the planning area (Plafcan et al. 1995). Its water-bearing characteristics are variable throughout the planning area, occurring under both confined and unconfined conditions (Plafcan et al. 1995). In general, water well yields vary from more than 300 gallons per minute in wells in the Riverton and Gas Hills area constructed for irrigation, industrial, and public supply purposes, to less than 50 gallons per minute in water wells developed for livestock and domestic purposes (Plafcan et al. 1995). A maximum yield of 3,000 gallons per minute was reported from a water well completed in the Wind River Formation (Richter 1981).

Data, obtained from more than 115 samples taken from water wells and springs, showed that samples obtained from Miocene-age formations (e.g., Split Rock Formation) and the Oligocene-age White River Formation did not exceed the 500 mg/L secondary maximum containment level for dissolved solids (Plafcan et al. 1995). However, radium-226 and uranium were detected at low levels in the one White River Formation sample analyzed for those constituents. Samples from the Eocene Wagon Bed Formation indicated dissolved-solids

concentrations just above the secondary maximum containment level at 572 mg/L; radium-226 and uranium also were detected at low levels in one sample.

In comparison, groundwater in the Wind River Formation was substantially lower in quality as measured in 80 samples that contained dissolved-solids concentrations ranging from 248 to 5,110 mg/L. In addition, one sample contained selenium at a concentration of 58 mg/L, which is above the EPA maximum contaminant level. One sample of seven contained detectable radium-226 and uranium, and one sample of 10 contained detectable levels of two selected pesticides.

Wind River Formation water chemistry is variable due to the formation's variable lithology, permeability, recharge conditions, and land use. Dissolved-solids concentrations in water samples from these wells and springs ranged from 248 to 5,110 mg/L, and some samples contained variable amounts of dissolved metals and radiochemical constituents such as radium-226 and uranium. One sample contained a detectable level of two (2,4-D and dicamba) of the selected pesticides (Plafcan et al. 1995).

Table 3.12. Description of Water-Bearing Formations in the Uppermost Regional Hydrologic Unit

Description/Formation	Lithology and Distribution	Aquifer Characteristics
Moonstone Formation	Present only in the Granite Mountains area, consisting of a 0 to 1,350 feet thickness of soft claystone, shale, and tuffaceous sandstone containing some interbedded limestone, conglomerate, and pumicite.	Yields small quantity of water to many stock and domestic wells; large supplies could be obtained where saturated thicknesses are great or where permeability is enhanced by fractures. Water quality is generally good.
Split Rock Formation ("Arikaree")	Present in southeastern portion of the planning area, consisting of 0- to 2,700-foot thick cemented sandstone, containing lesser amounts of conglomerate, claystone, limestone, tuff, and pumicite.	
White River Formation	Present in the southern portion of the planning area, consisting of 0 to 650 feet thickness of bentonitic and tuffaceous mudstone with lenses of arkose and conglomerate, and beds of tuff.	
Wagon Bed Formation	Present in the southern portion of the planning area, consisting of 0 to 700 feet of bentonitic mudstone, locally tuffaceous, zeolitic mudstone and sandstone in persistent beds, volcanoclastics and conglomerates.	Probably would yield at least small quantity of water and possible larger supplies from sandstone and conglomerate beds.
Wasatch/Battle Spring Formation	Present in Great Divide Basin area of portion of the planning area, consisting of large boulders in a soft sandstone and shale matrix.	Known to yield only small amounts of water. However, large yields may be possible. Quality of water likely good.
Wind River and Indian Meadows Formations	Present at land surface throughout majority of planning area, consisting of 0 to 8,000 feet of interbedded siltstone, and sandstone and conglomerate containing some carbonaceous shale and thin coal seams.	Large supplies have been developed in the Riverton and Gas Hills area, and could be developed elsewhere, especially along the margins of the Wind River Basin. Yields small quantities to numerous and widely distributed stock and domestic wells. The quality of the water ranges from unfit for stock to good for domestic uses.
Fort Union Formation	Consists of 0 to 8,000 feet of conglomerate, sandstone, shale and carbonaceous shale in lower part grading to very fine grained clastics and upper part. Present at depth throughout most of the planning area.	Sandstones yield small supplies of water that is generally unsuitable for domestic use and might be marginal for stock.
Lance Formation	Sandstone interbedded with light to dark gray carbonaceous shale and thin coalbeds. Coarse intervals present at formation base.	Sandstones yield small supplies of water that is generally unsuitable for domestic use and might be marginal for stock.
Sources: Arneson et al. 1998; Whitcomb and Lowry 1968		

Regional Aquitard

Below the uppermost hydrologic unit, there is a thick sequence of Cretaceous age fine-grained rocks of marine origin such as shales and mudstones (e.g., Cody Shale) that comprise a regional aquitard or confining layer. This aquitard isolates the upper aquifer system from the lower aquifer system, which is represented by lower Cretaceous to Paleozoic rocks. Table 3.13, “Geologic Formations Comprising the Regional Aquitard” (p. 310) lists the characteristics of regionally confining formations, which in general correspond to the regional aquitard hydrologic unit (Whitcomb and Lowry 1968; Arneson et al. 1998).

Samples from Mesozoic rocks, which are included in the regional aquitard, generally indicated low water quality (Plafcan et al. 1995). All water samples collected from wells completed in the Cody Shale and Frontier Formation had dissolved-solids concentrations from one-half to approximately 14 times greater than the EPA secondary maximum containment level of 500 mg/L. Water quality from wells and springs tapping water from the Cloverly and Chugwater formations was generally better, with dissolved-solids concentrations ranging from approximately 400 to 1,500 mg/L. Dissolved-solids concentrations in 10 samples obtained from wells and springs in the Phosphoria Formation ranged from 215 to 3,690 mg/L.

Table 3.13. Geologic Formations Comprising the Regional Aquitard

Description/Formation	Lithology and Distribution	Aquifer Characteristics
Meeteetse/Lewis Shale	Sandstone, siltstone, shale carbonaceous shale, claystone and coal.	Sandstones yield small supplies of water that are generally unsuitable for domestic use and might be marginal for stock.
Mesaverde Formation	Consists of 0 to 1,575 feet of Sandstone, shale, siltstone, carbonaceous shale, and coal.	
Cody/Niobrara Shale	Consists of 3,000- to 5,000-foot thickness of shale with minor sandstone interbeds.	Not a source of groundwater. Forms a regional aquitard throughout the planning area.
Frontier Formation	Consists of 600 to 1,040 feet of lenticular sandstones interbedded with shale.	Yields small quantities of generally poor quality water although some supplies are usable for domestic use.
Mowry Shale	Consists of several hundred feet of hard, thin-bedded, siliceous bentonitic shale.	Not a source of groundwater.
Muddy Sandstone	Consists of 0- to 150-foot thick coarse-grained sandstone.	Known to locally yield small supplies of water suitable for stock.
Thermopolis Shale	Consists of several hundred feet of hard, thin-bedded, siliceous bentonitic shale.	Not a source of groundwater.
Sources: Arneson et al. 1998; Whitcomb and Lowry 1968		

Lower Regional Aquifer System

Below the regional aquitard layer there is a series of Jurassic through Permian age formations that locally contain permeable zones that can yield appreciable amounts of groundwater. These units do not always contain water-bearing zones that are regionally extensive and can include leaky confining units and aquitards. These formations provide a transition from the aquitard layer to the lower hydrologic unit. Dissolved solids in groundwater from upper Mesozoic rocks in Fremont County generally range between 280 and 6,000 mg/L, but can be higher when associated with oil-field produced water. Table 3.14, “Transitional Hydrologic Unit Formations” (p. 311) describes these transitional hydrologic units (Whitcomb and Lowry 1968; Arneson et al. 1998).

Table 3.14. Transitional Hydrologic Unit Formations

Description/Formation	Lithology and Distribution	Aquifer Characteristics
Cloverly and Morrison Formations	Consists of 200 to 700 feet of sandstone, siltstone, and shale in upper part; claystone and medium-to-coarse-grained sandstone in lower part.	Near outcrops, yields small to moderate quantities of water suitable for domestic use. Mineralization of water increases with distance from outcrops.
Sundance Formation	Consists of 300 to 435 feet of shale, siltstone, sandstone, and limestone.	
Gypsum Springs Formation	Consists of 0 to 230 feet of dolomite, limestone, gypsum and siltstone.	Not known to be a source of groundwater. Any yieldable water would likely be poor quality.
Nugget Sandstone	Consists of 0 to 425 feet of fine-to-medium grained, well-sorted sandstone.	Little water-bearing data are available, but probably would yield satisfactory amounts of water for domestic or stock use based on surface outcrop characteristics.
Chugwater Group	Siltstone, sandstone, and shale; limestone (Alcova Limestone member).	Yields small amounts of good-quality water in and near outcrops.
Dinwoody Formation	Consists of 10 to 155 feet of fine-grained sandstone in western part of planning area grading eastward to upper part of Goose Egg Formation, which consists of 0 to 300 feet of shale and siltstone interbedded with limestone.	
Phosphoria/Park City/Lower Goose Egg Formations	Interbedded dolomite, chert, limestone, siltstone, and sandstone, commonly containing intervals of phosphate bearing minerals.	Probably would yield small amounts of mineralized poor quality water.
Sources: Arneson et al. 1998; Whitcomb and Lowry 1968		

Below the transitional units, the lower hydrologic unit includes a series of carbonate and sandstone aquifers with great water yielding capacity. Transmissivities for the lower hydrologic unit typically range from 1,000 to 60,000 gallons per day per foot (Arneson et al. 1998). Most wells completed in the Tensleep Sandstone or Madison Limestone aquifers were reported to be in or near the outcrop area (Plafcan et al. 1995). Of the wells inventoried, well depths in the Tensleep aquifer ranged from 450 to 6,590 feet below land surface, with some wells displaying flowing artesian or near flowing conditions. Table 3.15, "Characteristics of Water-Bearing Formations Included in the Lower Hydrologic Unit" (p. 312) lists the main water-bearing formations in the lower hydrologic unit.

Table 3.15. Characteristics of Water-Bearing Formations Included in the Lower Hydrologic Unit

Description/Formation	Lithology and Distribution	Aquifer Characteristics
Tensleep Sandstone	Consists of 200 to 600 feet of medium-grained well-sorted sandstone. Present throughout the planning area.	Excellent aquifer yielding water under artesian to flowing artesian conditions near range front. Well yield increased quantities where fractured. Water quality decreases away from recharge area (with distance from range front).
Amsden Formation	Consists of 100 to 250 feet of limestone, dolomite, and shale interbedded with minor sandstone underlain by basal sandstone unit (Darwin Sandstone).	Water-bearing properties are not well known. Quality and quantity might be sufficient to supply domestic needs, but well completion depth required would likely be cost prohibitive in most places.
Madison Limestone	Consists of 300 to 700 feet of massive to thin-bedded limestone, containing some thin beds of chert and shale near the top. Present throughout the area.	Potentially voluminous producer where extensive fracturing and cavities are known to exist. Water quality data are sparse. Completion could be cost prohibitive basin-ward.
Darby Formation	Consists of 20 to 190 feet of dolomite, siltstone, sandstone and shale.	Known fetid odor when rock is broken might indicate water quality issues. Would likely yield sufficient quantities of water at least for stock use, but depth to completion could be cost prohibitive basin-ward.
Bighorn Dolomite	Consists of up 0 to 300 feet of dolomite with thin basal sandstone unit (Lander Sandstone).	Potentially voluminous producer where extensive fracturing and cavities are known to exist. Water quality data are sparse. Depth to completion could be cost prohibitive basin-ward.
Gallatin Limestone	Consists of resistant limestone beds interbedded with shaly units.	Water quality data are sparse. Depth to completion could be cost prohibitive basin-ward.
Gros Ventre Formation	Consists of up to 700 feet of interbedded shale, limestone, and micaceous sandy shale.	Water-bearing characteristics are largely unknown. Lithology suggests poor source of water. Depth to completion could be cost prohibitive.
Flathead Sandstone	Consists of approximately 200 feet of fine to coarse-grain sandstone with conglomeritic basal unit.	Might be good source of groundwater where weathered or fractured, yielding high-quality water near outcrops. Depth to completion could be cost prohibitive basin-ward.
Pre-Cambrian	Granitic crystalline rocks, metamorphic rocks.	Yields good quality water in sufficient quantity where fractured or weathered. Only cost-effective near outcrops.
Sources: Arneson et al. 1998; Whitcomb and Lowry 1968		

Where significant karst has developed (as in the upper Madison limestone in the Sinks Canyon area) or where interconnected fractures are present, yields are reported to be as high as 2,000 gallons per minute. Based on an inventory published in 1995, Madison aquifer well depths range from 1,400 to 4,210 feet below land surface, with some wells flowing at land surface (Plafcan et al. 1995).

Certain older and deeper formations, such as the Phosphoria and Tensleep, can be used to a limited extent as supplies of groundwater and have suitable groundwater characteristics. However, they generally occur below economical drilling depths in most of the Wind River Basin. Measured TDS in groundwater in Paleozoic formations generally ranges from 300 to 3,000 mg/L, but Permian rocks have been known to have groundwater with dissolved solids of more than 10,000 mg/L (Plafcan et al. 1995).

Existing groundwater supply conditions appear to be adequate for most anticipated uses (such as mineral exploration and stock water) on BLM-administered public lands in the planning area. Although climatic conditions resulting in periods of below average precipitation would be expected to impact groundwater levels, there is no apparent shortage of available water at the current rate of consumption.

Existing groundwater quality conditions are generally good, although quality is degraded in localized areas due to natural conditions related to the aquifer porous medium (e.g., hardness, radioactive solutes, and selenium), land use (e.g., domestic leach fields, livestock waste, agriculture, and wildlife), and reduced recharge due to factors such as drought or development over recharge zones. Depending on the toxicity and the concentration, a compound released into the environment may be considered a contaminant or pollutant. While the Safe Drinking Water Act currently specifically excludes hydraulic fracturing from Underground Injection Control (UIC) regulation under SDWA 1421 (d)(I), the use of diesel fuel during hydraulic fracturing is still regulated by the UIC program (EPA 2012c). Without appropriate site assessment, engineering, mitigation and monitoring, activities associated with oil and gas development and production may have the potential to contaminate ground and surface waters. However, all alternatives assume that BMPs and the requirements of the oil and gas program will be met which should prevent contamination.

Eleven samples obtained from wells and springs issuing from the Tensleep Sandstone aquifer indicated dissolved-solids concentrations ranging from 196 to 1,410 mg/L, while samples from the Madison Limestone aquifer ranged from 188 to 920 mg/L. Ten groundwater samples obtained from springs emanating from Precambrian rocks showed dissolved-solids concentrations ranging from 81 to 714 mg/L. The water samples in these rocks had the lowest average concentration of dissolved solids of any other water-bearing unit for which five or more samples were collected.

Groundwater Quality Susceptibility

Water system susceptibility is the potential for a public water supply to draw water contaminated at concentrations that pose a threat or concern to human health. The EPA developed a Source Water Assessment Program (SWAP) in 1996 to help public water systems protect their water supplies from contamination. The EPA directed each state to develop and implement a SWAP. Participation in the program in Wyoming was voluntary; participants in the planning area include Lander, Riverton, Shoshoni, Hudson, Jeffrey City, Dubois, and several state parks. Participants' SWAP information reports were completed in 2004 and are available on the Wyoming DEQ webpage. The determination of susceptibility was based in part on the presence of potential contaminants or "land-use susceptibility" (BLM 2009a). For example, in South Pass City (historical site), susceptibility in one zone was deemed to be high because of high point-source contamination from a solid/hazardous waste site. Other factors such as water supply integrity and sensitivity were considered. Additionally, recent groundwater sampling conducted by the EPA near Pavillion, Wyoming detected several petroleum hydrocarbons, including benzene and methane (CH₄), in wells and groundwater. EPA also found low levels of petroleum compounds

in 17 of 19 drinking water wells sampled. Wyoming DEQ is utilizing the information from the SWAP and its Wellhead Protection Program to develop monitoring and remediation plans that will provide valuable information for the BLM to consider when permitting activities.

Groundwater Trends

The State of Wyoming through the State Engineer's Office authorizes the beneficial uses of water and the associated construction of water supply wells. It is unusual (less than once per year in the Lander Field Office) for a BLM-authorized oil and gas operation to require drilling a water well on public lands, although the operators may contract with private sources of water as part of drilling operations (BLM 2009a). However, groundwater wells are almost always a required component of uranium exploration activity to supply makeup water for drilling operations. Groundwater for these operations is typically supplied from existing wells from previous uranium exploration activities, converted oil and gas wells, or in some cases, new purpose-built water wells drilled onsite by the uranium exploration operator. Generally, impacts from these types of water wells are limited because of the relatively small amounts of groundwater required for exploration operations. However, improperly completed or abandoned water wells or monitoring wells can contribute to degraded groundwater quality where waters of differing quality are allowed to communicate through the borehole. Where the use of backflow preventers (restricts siphoning back into the water well) are not required, or the water wells are not secured against unauthorized entry, direct contamination of groundwater can also occur.

Generally, the production of water from oil and gas operations is a disposal issue and not an impact to water quantity because most oil and gas wells do not produce from aquifers meeting the EPA drinking-water standards. However, there is an increased risk of contamination where the oil and gas reservoir is located close to the surface, within an unconfined aquifer being used as a drinking water source, or where the reservoir is connected to a drinking water aquifer through underground faults and fissures. In order to inject produced water for disposal, applicants must receive an aquifer exemption from the EPA. The Madison Formation, for example, contains potentially potable water, but some injection wells have received aquifer exemptions for the Madison Formation because the EPA has deemed the formation to be too deep to be considered a potential source of drinking water (BLM 2009a). Such exemptions are limited in scope to the proposed injection well and are not applied broadly across the aquifer. A modification of the Safe Drinking Water Act (Public Law 95-523) might include consideration of fracking chemicals; at present, these are not directly regulated by the BLM, but they are regulated by the State of Wyoming.

Surface Water and Groundwater Quantity and Use

To understand trends related to groundwater use and to better plan for the future, long-term water level data from wells and flow rates from springs are critical. However, historical groundwater level data for the planning area either does not exist or is limited to surficial alluvial aquifers.

The most recent usage data for Fremont County (covering most of the planning area) was compiled by the USGS in 1990 (Plafcan et al. 1995). Table 3.16, "Estimated Groundwater Use in 1990 in Fremont County" (p. 315) compiles these data for Fremont County; it is likely that these data understate current use. No information is available on surface water withdrawal volumes in the planning area. Information contained in the 2010 Wind/Bighorn River Basin Water Plan (WWDC 2010) suggests that water usage from both groundwater and surface sources is projected to increase with increases in population. The 2010 plan estimates that current industrial and mining water use is approximately 6.4 million gallons per day. This number is not expected to

significantly change over time due to the active plugging and abandonment of oil and gas wells and the increasing use of recycling to supplement water needs.

Table 3.16. Estimated Groundwater Use in 1990 in Fremont County

Water Use	Groundwater (million gallons per day)
Public Supply	2.5
Domestic	1.1
Commercial	0.1
Mining	1.7
Irrigation	0
Livestock	0.2
Industrial	0.3

Source: Plafcan et al. 1995

The Wyoming State Engineers Office is charged with regulation and administration of water resources in Wyoming. The Surface Water and Engineering Division is responsible for reviewing permit applications for any request to put Wyoming surface waters to beneficial use. The Ground Water Division is charged with registering groundwater rights for all uses except stock and domestic. The Wyoming DEQ is responsible for enforcing state and federal water laws, including the Clean Water Act, National Pollutant Discharge Elimination System, Environmental Quality Act, and Federal Surface Mining Reclamation and Control Act. BLM management actions or use authorizations must comply with all federal and state water quality laws, rules, and regulations to address water quality issues that originate on public lands.

Management Challenges for Water

Waterbodies listed in the Wyoming DEQ 305(b) Report impose a management challenge. In 2006 there were three streams listed:

1. Crook's Creek is listed due to oil from an unknown source in the sediment on private land near Jeffrey City. It is a high priority scheduled for TMDL development.
2. Poison Creek is listed due to fecal coliform bacteria levels from below the town of Shoshoni to Boysen Reservoir. The Lower Wind River Conservation District is developing a watershed plan, so Poison Creek is a low priority for TMDL development.
3. The Middle Fork of the Popo Agie River near Lander is listed due to fecal coliform. It is a low priority for TMDL development because the Popo Agie Conservation District has developed a watershed plan to identify sources of fecal contamination and voluntarily remediate them.

Protecting sole source domestic water supplies is a management challenge. The city of Lander obtains most of its domestic water needs from the Middle Fork of the Popo Agie River, so authorized activities here would require an extra level of scrutiny to ensure that water quality is not compromised (Lower Wind River Conservation District 2010). Other municipal sources of water are currently being considered, including deep wells targeting Paleozoic formations in the Middle Fork watershed. When fully developed, these wells would provide additional sources of water in low-runoff years or supplement the surface water supply.

Increasing interest for in situ recovery (ISR) uranium mining imposes a management challenge because it has the potential to degrade groundwater quality and quantity. Wyoming DEQ does not allow water quality to be degraded below what is required for the previously classified level,

but does not require that the water quality return to its predisturbance condition. ISR uranium mining operations consume groundwater, because approximately 10 percent of all water pumped from subsurface mine units is typically bled to surface impoundments where it is allowed to evaporate. A substantial concentration of these operations in parts of the planning area with limited recharge would be expected to lower the head in upper regional hydrologic units, such as the Wind River or Battle Springs Formations.

Oil and gas operations have the potential to impact groundwater quality. In general, however, safeguards such as casing design and selection of injection well receiving horizons protect groundwater quality. The recent interest in Coalbed Natural Gas (CBNG) development is expected to impact the amount or the configuration of groundwater supplies through the withdrawal of groundwater and the subsequent reinjection to other aquifers or direct discharge to the land surface.

Water developments for livestock grazing use is an additional management challenge. The availability and use of water is a limiting factor in locating and managing livestock grazing. Limiting the depletion of the Platte River water to protect downstream special status species is another important management challenge for water resources in the planning area.

Additional Information on Area Hydrology

The Wyoming DEQ maintains a website with current information on Wyoming hydrology. Information regarding the Wind River Basin may be found at http://waterplan.state.wy.us/plan/bighorn/2010/finalrept/gw_toc.html. That page has links to the planning area's other river basins, including the Platte and Snake (WSGS 2012).

3.1.5. Cave and Karst Resources

Karst topography consists of landforms produced by the dissolution of rock, creating a variety of landscape features including caves and sinks. Cave and karst resources are fragile because of their association with other resources such as groundwater systems and biological communities. They can also be considered nonrenewable resources due to paleontological and archeological deposits, speleothems (formations inside caves), and biological resources.

A cave is defined as any naturally occurring void, cavity, recess, or system of interconnected passages beneath the surface of the Earth, or within a cliff or ledge large enough to permit an individual to enter, whether or not the entrance is naturally formed or man-made (The Federal Cave Resources Protection Act [FCRPA], Sec. 3[1]). The FCRPA of 1988 was the first federal legislation to recognize caves and their contents as whole, integrated ecosystems. The FCRPA declares significant caves on federal lands as an invaluable and irreplaceable part of the nation's heritage. The DOI implementation regulations for FCRPA require that federal lands be managed in a manner that, to the extent practical, protects and maintains significant caves and cave resources (43 Code of Federal Regulations [CFR] Part 37.2). BLM policy and guidance for managing cave resources is to protect sensitive, fragile, biological, ecological, hydrological, geological, scientific, recreational, cultural, and other cave values from damage and to ensure they are maintained for use by the public, both now and in the future (BLM 2008b).

Under the FCRPA, a cave is considered significant if it meets one or more of the following six criteria (43 CFR Part 37):

- **Biota** – The cave serves as seasonal or yearlong habitat for organisms or animals, or contains species or subspecies of flora or fauna native to caves, or is sensitive to disruption, or contains species found on state or federal sensitive, threatened, or endangered species lists.
- **Cultural** – The cave contains historic or archeological resources included in or eligible for inclusion in the National Register of Historic Places (NRHP) because of its research importance for history or prehistory, its historical association, or other historical or traditional significance.
- **Geological/Mineralogical/Paleontological** – The cave possesses one or more geologic or mineralogical features that are fragile or exhibit interesting formations.
- **Hydrologic** – The cave is part of a hydrologic system or contains water important to humans, biota, or development of cave resources.
- **Recreational** – The cave provides recreational opportunities or scenic values.
- **Educational or Scientific** – The resource offers opportunities for educational or scientific use or is in a virtually pristine state, lacking evidence of contemporary human disturbance or impact, or the length, height, volume, total depth, or similar measurements are notable.

No significant caves have been identified in the planning area; however, there has been no formal inventory of cave and karst resources. Limestone geology in the planning area is conducive to cave and karst resources and inventories may identify additional cave and karst resources. Known locations of natural caves in the planning area include Sinks Canyon, Baldwin Creek Canyon, Popo Agie Canyon, North Fork Canyon, Sawmill Canyon, and portions of the Beaver Creek drainage.

The Sinks in Sinks Canyon State Park (adjacent to and downstream of BLM-administered land) is one of the best known sinks in the area. Typical of a karst river, the Popo Agie disappears in the Sinks as it flows into a cave formation in Madison Limestone and then rises again into a pool one-half mile down canyon. Other karst formations are known to exist in the planning area, such as the sinkholes on Auer Ranch on Beaver Creek and south of the hot spring, and in Dubois near the airport.

Management Challenges for Cave and Karst Resources

No cave and karst resources in the planning area have been reviewed for significance under the FCRPA, nor are they managed as such. Management challenges include performing a formal inventory to identify significant caves and, as needed, managing these resources according to FCRPA requirements and BLM policy.

3.1.6. Lands with Wilderness Characteristics

The BLM inventories and manages lands with wilderness characteristics. These lands are distinct from Wilderness Study Areas (WSAs); WSAs are discussed in the *Wilderness Study Areas* section. This Environmental Impact Statement (EIS) incorporates by reference the Lander Field Office wilderness inventory files.

Pursuant to the 2011 Continuing Resolution, the Secretary of the Interior issued guidance stating that the BLM will not designate any lands as “Wild Lands,” as had previously been provided for under Secretarial Order 3310. However, the guidance also stated:

As required by law, the BLM will continue to maintain inventories of lands under its jurisdiction, including lands with wilderness characteristics. Also, consistent with [section 201 and 202 of] the Federal Land Policy and Management Act (FLPMA) and other applicable authorities, the BLM will [inventory and] consider the wilderness characteristics of public lands when undertaking its multiple use land use planning and when making project-level decisions.

Washington Office IM 2011–154 entitled: *Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans* further clarified the process outlined and authorized under FLPMA.

The process that the Lander Field Office used to develop the RMP is consistent with the latest direction issued as a result of the 2011 Continuing Resolution and the associated direction contained in FLPMA. During the planning process, the Lander Field Office identified lands with wilderness characteristics through the inventory process described below. The criteria used to evaluate lands with wilderness characteristics is derived from the Wilderness Act and IM 2011–154. In order for an area to qualify as lands with wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. In addition, it may also possess supplemental values. This RMP includes a full range of alternatives regarding management of lands with wilderness characteristics. In this document, the BLM refers to lands with wilderness characteristics managed to protect wilderness values as “non-WSA lands” to distinguish management of these lands from management of WSAs.

To support the RMP revision, the Lander Field Office has maintained the original 1980s (conducted in support of identifying WSAs) inventory. The first step in the inventory process was to identify roadless areas over 5,000 acres or meeting one of the size requirements. Nearly all of the areas that were found to meet one or more of the size requirements corresponded with Citizen Proposed Wilderness (CPW) and/or were reviewed in the existing inventory files. In addition, every CPW was reviewed independent of the size criteria determinations. The BLM also conducted an extensive review of the citizens’ proposal and other information to determine whether the situation on the ground had changed or new information had come to light since the original inventory. The Lander Field Office AMS documented and served as an update for Lander Field Office wilderness characteristics inventory. No public comments were received disagreeing with these findings.

In support of this planning effort the BLM has further updated its inventory of lands with wilderness characteristics to ensure consistency with the direction contained in the Wilderness Act, FLPMA, and IM 2011–154. Since the criteria to evaluate lands with wilderness characteristics has not changed, minimal changes resulted from this update. Initial findings indicated 20 areas warranted additional inventory review. Nearly all of these areas were inventoried in the 1980s and were found not to contain wilderness character and/or correspond with the CPWs discussed below.

In order for an area to be classified as land with wilderness characteristics, it must possess sufficient size, naturalness, and outstanding opportunities for either solitude or primitive and unconfined recreation. In addition, it may also possess supplemental values. In parts of the United States with more precipitation and rapid vegetation growth, conditions can change dramatically

over several decades. The semi-arid conditions and slower vegetation growth in the planning area mean that conditions change more slowly. For example, reclaimed or abandoned roads are often visible as roads for many decades (e.g., the National Historic Trail [NHT] used during the westward pioneer migration) and might never return to a primitive condition. In addition, over the last 20 years, the amount of area containing wilderness characteristics has declined. Other resource uses, such as motorized or developed recreation, have affected the number of areas that contain wilderness characteristics. The recent recreation setting inventory found that the planning area does not contain “primitive” physical settings and contains only a limited number of locations with “back country” physical settings. The recreation setting inventory found that although some portions of the planning area provide situations in which the likelihood of visitor-to-visitor contacts and development is low, the overall trend is one of increasing urbanization (BLM 2009a). This trend, in addition to the slow reclamation of disturbed areas discussed previously, indicates a potential threat to the continuation of wilderness characteristics under current management.

As part of the inventory update, and in addition to the citizens’ proposals discussed below, the BLM performed intensive wilderness inventories in several other areas, including Lewiston Lakes, Soap Holes, Lime Kiln Gulch, Stampede Bog, Black Rock Gap, Lankin Creek, Wolf Gap, and the Dry Creek of the Copper Mountains. As detailed in the Lander Field Office wilderness inventory files, these areas were found to not contain wilderness characteristics. The rest of this section provides a discussion of some key areas in the planning area that the citizens’ proposals recommended for consideration as lands with wilderness characteristics.

Fuller/Greer Peak

The Fuller/Greer Peak area reviewed for wilderness characteristics consists of 9,076 acres of BLM-administered surface. Upon review of available data, the BLM determined that the area did not possess naturalness, outstanding opportunities for solitude, or outstanding opportunities for primitive/unconfined recreation. Influential factors on this determination included: numerous motorized ways, constructed roads, fences, digs and scrapes in support of mining activities, a lack of screening vegetation or topography, and the area being located within a H₂S gas plant influence area. In addition, the citizens’ proposal did not contain sufficient information to indicate the BLM’s inventory findings were deficient or outdated. Recreation opportunities, visual resources, vegetation, and other resource values in the area might warrant additional management consideration; however, this would need to be considered under other program areas.

Lysite Badlands

The Lysite Badlands area reviewed for wilderness characteristics consists of 14,745 acres of BLM-administered surface. Upon review of available data, the BLM determined that the area did not possess naturalness, outstanding opportunities for solitude, or outstanding opportunities for primitive/unconfined recreation. Influential factors on this determination included: numerous motorized ways, constructed roads, fences, producing gas wells, lack of screening vegetation or topography, omnipresent visual and auditory human influences occurring outside the unit, and the area being located within a H₂S gas plant influence area. The citizens’ proposal does not contain sufficient information that would indicate the BLM’s inventory findings were deficient or outdated. Recreation opportunities, visual resources, vegetation, and other resource values in the area might warrant additional management consideration; however, this would need to be considered under other program areas.

Lysite Mountain

The Lysite Mountain area reviewed for wilderness characteristics consists of 8,401 acres of BLM-administered surface. Upon review of available data, the BLM determined that the area did not possess naturalness, outstanding opportunities for solitude, or outstanding opportunities for primitive/unconfined recreation. Influential factors on this determination included: constructed roads, fences, unnatural vegetation treatments, lack of screening vegetation or topography, and the area being located within a H₂S gas plant influence area. The citizens' proposal did not contain sufficient information that would indicate the BLM's inventory was deficient or outdated. Recreation opportunities, visual resources, vegetation, and other resource values in the area might warrant additional management consideration; however, this would need to be considered under other program areas.

Whiskey Mountain Complex: Red Creek, Torrey Rim, Whiskey Mountain, Glacier Trail

Since the original inventory and citizens' proposal, the BLM split the complex into two inventory units discussed below:

- **Little Red Creek Complex** (including: Little Red Creek and Torrey Rim) As part of this inventory update and planning process the Little Red Creek and Torrey Rim units are combined to form the Little Red Creek Complex (5,490 acres). The citizens' proposal cited the need to conduct a review of the area due to land acquisitions since the original inventory. As a result of the land acquisition all of these units are connected by a contiguous boundary. Since the Torrey Rim and Little Red Creek units are no longer separate land tracts, the units are now combined into the Little Red Creek Complex. The Glacier Trail unit will remain a distinct unit due to its geographic isolation from the rest of the unit. All of these lands share a contiguous boundary with the USFS Fitzpatrick Wilderness Area. All of these units have been found to contain naturalness, and with the acquisition, now have outstanding opportunities for primitive and unconfined recreation that mimic those of the Wilderness Area. The area is also currently managed as an Area of Critical Environmental Concern (ACEC) to protect the important seasonal ranges of bighorn sheep and scenic values. Current management is complementary to maintaining the wilderness characteristics of the area. As such, the Little Red Creek Complex is recognized as land with wilderness characteristics.
- **Glacier Trail:** Originally this area was found to contain wilderness characteristics due to its continuity (primarily a connecting trail) to the Little Red Creek Complex. However, upon further review it was found that the connecting trail was obliterated by a landslide and relocated onto adjacent USFS lands. Therefore, the Glacier Trail unit (352 acres) was evaluated separately from the Little Red Creek Complex. In addition to the landslide closing the trail, the adjacent USFS lands to the east are managed as multiple-use lands, not Wilderness. The boundary of the USFS Fitzpatrick Wilderness Area follows the skyline or ridgetop up Arrow Mountain and intentionally skirts the USFS lands to the east of the unit, implying that the values below this rim (including those within the 352 acre Glacier Trail unit) were not contiguous with the Wilderness Area. The unit is identical to these multiple-use lands in terms of its relationship to and impacts from the Torrey Creek drainage and Trail Lake Campgrounds, Wyoming Game and Fish Department (WGFD) hay meadows, the WGFD field school, and trail heads. Because of these factors, and the fact that the active landslides continue to limit recreational opportunities in the area, the Glacier Trail unit was found to not have outstanding opportunities for solitude or primitive and unconfined recreation, and therefore does not contain wilderness characteristics.

- **Whiskey Mountain:** The citizens' proposal encompasses the Whiskey Mountain WSA and an area to the east of the WSA. This CPW totals 1,589 acres. The citizen's proposal cherry stems an active road and communication tower; and also encompasses a rehabilitated motorized way and an existing motorized way used on an intermittent basis. The cherry stem of the citizens' proposal creates approximately a .25 mile bottleneck area between the designated wilderness and the area proposed for wilderness. The original BLM inventory removed this area from WSA consideration and intensive inventory due to the impacts to wilderness characteristics from the human modification, and the lack of screening vegetation and topography of the unit. Since these impacts and attributes still exist today, the wilderness characteristics of the area were found not to be contiguous with the WSA or Fitzpatrick Wilderness Area. Therefore, the area does not meet any of the size requirements and does not contain lands with wilderness characteristics.

Sweetwater Rocks Wilderness Study Area Complex

The citizens' proposal recommends acquisition of several parcels of state land adjacent to the existing WSAs. These state lands are not evaluated as part of this effort. The proposal also recommends managing 3 public land units (totaling 11,420 acres) on the northeast and eastern boundaries of the Savage Peak WSA to preserve wilderness characteristics. Two of these parcels are not contiguous with the WSA, do not meet any of the size criteria, are less than 5,000 acres of contiguous BLM-administered land, and are narrow land masses which are not practical to preserve and use in an unimpaired condition. Management of these additional public lands would only be possible if state lands separating the areas were acquired. The Devil's Gate extension did, however, share a contiguous boundary with the WSA.

The BLM review found that the Devil's Gate area, which was recommended in the citizens' proposal, and met the size criteria, did not possess naturalness and outstanding opportunities for solitude or primitive and unconfined recreation. This determination was due in part to the heavy existing developed recreational use occurring within the area and the fact that the areas shared only a ¼ section of public land that connects the area to the larger Savage Peak WSA. Such a bottleneck and extensive recreation developments do not represent outstanding opportunities for solitude and result in confinement of recreationists. Recreation opportunities, visual resources, vegetation, and other resource values in the area might warrant additional management consideration; however, this would need to be considered under other program areas. Refer to the *Wilderness Study Areas* section of this document for additional information on existing WSAs in the planning area.

Copper Mountain Wilderness Study Area

The citizens' proposal included 240 acres located outside of the existing WSA. This area was originally excluded from the WSA due to an existing gas well and road. Upon review of 2009 aerial photos, the BLM found the road and well pad still exist in the area, and therefore the area is not contiguous to the WSA. Since the area does not meet any of the size requirements it is not considered a land with wilderness characteristics.

Area North of Honeycomb Buttes, Oil Mountain, and Antelope Hills

General scoping input suggesting the presence of wilderness characteristics was received for the portion of the planning area located to the northeast of the Honeycomb Buttes WSA, which is managed by the Rock Springs Field Office. Other general suggestions of wilderness characteristics included Oil Mountain and the Antelope hills. Evaluation determined that the areas contained several constructed roads and therefore did not meet the size requirements necessary to

contain wilderness characteristics. However, the BLM determined through scoping comments that there is widespread public interest in having the Antelope Hills/Area North of Honeycomb Buttes areas managed for recreational value and also for its proximity to the Congressionally Designated Trails. The areas support recreational opportunities involving solitude and primitive experience and other unique experiences. See Chapter 2 for recreation and trails management.

3.2. Mineral Resources

The BLM manages a total of 2,809,101 acres of federal mineral estate in the planning area which does not include mineral estate underlying USFS or WRIR lands (Map 2). In addition, the BLM has a fiduciary trust responsibility for the administration of minerals on the WRIR. The BLM supervises operational activities (e.g., inspection and enforcement) on Native American mineral leases, and provides advice on leasing and operational matters to the Bureau of Indian Affairs, Native American tribes, and Native American mineral owners. The BLM does not make land management decisions on the Reservation; however, where applicable, this section includes the current condition and activity of mineral development on the WRIR to set a baseline for the cumulative effects analysis in Chapter 4.

Mineral resource types in the planning area include locatable (uranium, bentonite, gold, gypsum, etc.), leasable (coal, oil shale, geothermal, oil and gas, other solid leasable minerals such as phosphate), and salable (sand, gravel, moss rock, etc.) minerals. Each individual resource section below defines and describes these resources, their existing conditions, and management challenges.

Development and extraction of mineral resources from federal mineral estate are authorized under federal legislation including:

- The General Mining Law of 1872, as amended, which authorizes the location of mining claims and mill sites on public lands, and the exploration for and mining of “locatable” minerals such as gold, silver, uranium, bentonite, gypsum, metallurgical-grade limestone, and gemstones.
- The Mineral Leasing Act of 1920, as amended, which authorizes the BLM to issue leases for developing “leasable” minerals such as coal, oil, natural gas, oil shale and other hydrocarbons, and phosphates, sodium, and other specific mineral commodities on public lands.
- The Materials Act of 1947, as amended by the Surface Resources Act of 1955, which authorizes the BLM to sell at fair market value or allow the free use of mineral materials (“salable” minerals) such as common varieties of sand, gravel, pumice, cinders, clay, and stone through contracts or free-use permits, as well as petrified wood under the Petrified Wood Act of 1962.

The management authority of the BLM varies substantially depending upon the type of legislation that allows the mineral development. These differences are discussed below.

3.2.1. Locatable Minerals

Locatable minerals known to occur in the planning area include, but are not limited to, uranium, bentonite, gold (both lode and placer deposits), silver, gypsum, copper, tungsten, tantalum, zeolites, iron, and gemstones (precious and semi-precious) such as agate, opal, jade, sapphire, beryl, and garnet.

Most of the commercial locatable mineral activity in the planning area focuses on uranium, bentonite, and gold exploration. There are currently no operating uranium mines and one-BLM permitted, but inactive, bentonite mine in the planning area. Gold panning is a popular activity in the South Pass/Atlantic City area.

Opal and agate collecting attracts hobbyists to the planning area. In 2005, a large deposit of opal was discovered near Cedar Rim, north of Sweetwater Station. This discovery was publicized by the Wyoming State Geological Survey and touched off a modern-day “land rush” that resulted in more than 1,000 mining claims registered at the Fremont County Courthouse in a span of two months (BLM 2009b). Most of the opal found in the planning area is “common opal,” but some of the highly valued “precious opal” was reportedly found (BLM 2009b). This activity has substantially abated over the last few years and only a few mining claims remain.

Statutory and Regulatory Authorities

The General Mining Law of 1872, as amended, opens public lands to exploration and development of “locatable” minerals. The 1872 Mining Law allows U.S. citizens or corporations to decide where and when to locate (stake) mining claims and mill sites on public lands that are open to (not withdrawn from) operation under the General Mining Law.

Leaving such decisions to citizens or corporations is characterized as being “non-discretionary,” meaning that the Secretary of the Interior, or the BLM as the agency delegated with the responsibility to oversee implementation of the General Mining Law, has no discretion or authority to direct where or when placer or lode mining claims, mill sites, or tunnel sites can be located on open public lands. In addition, because the General Mining Law, as amended, authorizes location of mining claims, exploration, and mining that are in conformance with statutes and implementing regulations, the BLM does not have the discretion to disapprove such actions unless the actions do not comply with the requirements.

Section 302(b) of the FLPMA requires that the Secretary of the Interior take any action necessary to prevent unnecessary or undue degradation of federal lands. Therefore, the BLM may not allow unnecessary or undue degradation of public lands resulting from operations under the General Mining Law (see also 43 CFR 3809 for General Mining Law implementing regulations). If the BLM is notified of pending operations at the “notice” level under 43 CFR 3809 (see below) that the agency believes would cause unnecessary or undue degradation of public lands, the agency must notify the proponent that it may not proceed without modifying the proposal to comply with requirements to prevent such degradation. Similarly, the BLM may not approve a Plan of Operations under 43 CFR 3809 that would cause unnecessary or undue degradation to public lands. However, if a notice or Plan of Operations meets all requirements, the agency must allow operations to proceed.

Unlike other mineral resources such as leasable minerals (e.g., oil and gas) or salable minerals (e.g., sand and gravel), withdrawal of land is the only management prescription available for controlling the location of locatable mineral development. The BLM may propose to withdraw portions of public lands from operation under the General Mining Law, subject to valid existing rights and certain limitations (FLPMA, Sec. 204). Map 21 shows existing areas withdrawn from operation under the General Mining Law.

The regulations at 43 CFR 3809 allow for three levels of General Mining Law operations: casual use, notice-level operations, and plans of operations.

- **Casual Use.** Casual use activities are locatable mining activities that result in no or negligible disturbance of public lands or resources. Gold panning is a typical example of a casual use activity. Note that where the cumulative effects of casual use by individuals or groups will result in more than negligible disturbance, the BLM may establish specific areas wherein such persons must contact the agency 15 days before start-up to determine whether a notice or Plan of Operations might be required (see 43 CFR 3809.31).
- **Notice-Level Operations.** Notice-level operations include exploration causing surface disturbance of 5 or fewer acres of public lands, and bulk sampling in which operators remove less than 1,000 tons of presumed ore for testing. Notification via a written “notice” to the BLM is required 15 calendar days before commencing operations. No BLM approval is required for notice-level operations.
- **Plan of Operations.** A Plan of Operations is required for all locatable mineral activities exceeding casual use. For exploration-only operations disturbing less than five acres, a notice is the only requirement which does not require BLM approval. In the notice or Plan of Operations, the operator must disclose occupancy or uses they believe are reasonably incident to mining as described in 43 CFR § 3715.0-5.

Locatable Mineral Activity

Uranium related mining activities have the most notice-level operations in the planning area, followed by gold and bentonite (Table 3.17, “Notices and Plans of Operations in the Planning Area, as of the End of 2008” (p. 324)). Gold-related mining activities account for the greatest number of plans of operations in the planning area (Table 3.17, “Notices and Plans of Operations in the Planning Area, as of the End of 2008” (p. 324)).

Table 3.17. Notices and Plans of Operations in the Planning Area, as of the End of 2008

Commodity	Number of Notices	Number of Plans of Operations	Disturbed Area (acres)
Bentonite	5	1	121
Gemstones and lapidary material ¹	1	0	4.5
Gold, lode ²	2	4	10.6
Gold, placer ³	4	3	145
Uranium ⁴	16	2	80
Zeolites ⁵	1	0	1

Source: BLM 2009b

¹ Includes diamonds, rubies, sapphires, emeralds, jade, opal, and other precious and semi-precious stones.

² Does not include nine notices and one plan with a pending status for an additional 169 acres.

³ Does not include four notices with a pending status for an additional 3 acres.

⁴ Does not include two notices and five plans with a pending status for an additional 8,017 acres.

⁵ This case is pending.

The sub-sections below further describe the primary types of locatable minerals in the planning area.

Locatable – Uranium

Uranium occurs geologically in four main classes of deposits, one of which is dominant in the planning area (the “roll front” deposit). The “fronts” form when a uranium rich source rock is leached when groundwater passes through. The uranium is dissolved and re-deposited when the

groundwater loses its dissolved oxygen. These geologically favorable areas occur in certain groundwater basins in southwestern Wyoming as well as the Powder River Basin in northeast Wyoming, and are the host for uranium deposits in the planning area.

Roll type deposits are the most important uranium deposit type being extracted by ISR technology. Roll-front deposits with the simplest form occur as classical rolls formed in sands of uniform lithology and permeability.

Uranium deposits in the Gas Hills area are hosted in the Eocene Wind River Formation. In the Crooks Gap area, roll-front deposits are found in the Eocene Battle Springs Formation, while roll-front deposits in the Bison Basin region are found within sandstones in the Eocene Wasatch-Green River Formation (Map 15). Another important deposit in the Copper Mountain area contains low-grade uranium in the Eocene Teepee Trails Formation, and igneous rocks including Precambrian granites and quartz monzonites.

Uranium Mining and Exploration Activities

Fremont County has accounted for more than 26 million tons of uranium ore since mining began in the 1950s. Fremont County ranks second in the state for total uranium produced. There are three major uranium districts in the planning area: Gas Hills, Crooks Gap (including Green Mountain) and informally, the Bison/Great Divide Basin district (Map 15). At present, various entities are exploring all three districts though no mining is occurring as of late 2009.

Mining in the Gas Hills District has been predominately by open-pit methods. In the Crooks Gap District, mining occurred by both open-pit and underground operations. Mining at the Bison Basin Project in the Bison/Great Divide District was conducted using ISR methods.

There was new major development activity in the Crooks Gap District through the 1990s when the Jackpot Mine at the base of Green Mountain was developed and subsequently reclaimed (with no mining occurring). Minor exploration drilling on Green Mountain then occurred during 2007. Some projects attempted to enter interim management to wait for better market conditions to return, but eventually most producing mining ventures began reclamation activities. Kennecott Uranium Company states that Big Eagle Mine remains in operational status under Permit 451. Of the mines that began reclamation activities, most are administered under the state Abandoned Mine Lands (AML) program for a variety of reasons, including bankruptcy of mine operators, insufficient bond to complete reclamation, or the fact that many operations were initiated long before mining laws required reclamation and bonding.

Since the early 1980s, there has been little actual mining as uranium market conditions have declined. The last production in the Gas Hills District was in 1984, in Crooks Gap at Sheep Mountain in 1985, and in 1982 at the ISR uranium mining project in Bison Basin. There are several other known occurrences of uranium bearing ore bodies in the planning area; however, these are of lesser importance and only produced small volumes of ore. Slowly increasing uranium prices in the past several years have caused renewed interest in exploration and mining, as evidenced by the number of notices for uranium filed with the BLM under 43 CFR 3809 (Table 3.17, “Notices and Plans of Operations in the Planning Area, as of the End of 2008” (p. 324)).

Uranium Milling

The process of uranium recovery focuses on extracting (or mining) natural uranium ore from the earth and concentrating (or milling) that ore. These recovery operations produce a product called “yellowcake,” which is then transported to a fuel cycle facility. Uranium recovery typically involves several types of milling methods.

Conventional milling refers to the process in which uranium ore is removed (mined) from deep underground shafts or shallow open pits and then crushed and subjected to physical and chemical processes to extract uranium from the mined ore. Heap leach is a process similar to conventional milling in which physical and chemical processes are used to extract uranium from mined ore that has been crushed and piled in a heap. The solution drains through the heap and is captured in a system of drains for further processing. The ISR process utilizes a chemical process to extract uranium from underground deposits. The chemical solution is delivered directly to the ore body by injection wells, circulated, and then pumped out. The solution, once laden or “pregnant” with soluble uranium, is processed further to precipitate the uranium.

The challenge in operating any uranium milling facility is to mitigate groundwater impacts. In some cases, alternate concentration limits are used as standards for restoring groundwater quality affected by the operation of uranium milling facilities. Alternate concentration limits are risk-based concentration limits used to establish alternative groundwater protection standards.

Conventional Uranium Mill Site Disposition

In the past 50 years, numerous conventional uranium milling facilities have been in operation in the planning area, including several in Gas Hills, one in Riverton, and the Split Rock Mill in Crooks Gap, which was the first uranium mill in Wyoming. At present, with the exception of one mill, all mills in the State of Wyoming are undergoing or have been decommissioned. The still existing Sweetwater Mill is the only conventional uranium mill left in the State of Wyoming and is located south of the planning area approximately 45 miles northwest of Rawlins. This mill is one of six operational conventional mills left in the United States and has been on standby status since 1983.

It is the policy of the Nuclear Regulatory Commission to transfer lands used for uranium mill sites, processing, and the storage of processing waste (tailings) to the U.S. Department of Energy (DOE) for long-term monitoring and oversight. Table 3.18, “Segregated Lands at Uranium Mill Sites in the Planning Area” (p. 326) identifies lands segregated from land use laws in preparation for withdrawal and transfer to DOE. Mill specific information can be found in the *Final Mineral Occurrence and Development Potential Report* (BLM 2009b).

Table 3.18. Segregated Lands at Uranium Mill Sites in the Planning Area

Mill Site	Township/Range	Section(s)	Acreage ¹
Western Nuclear – Split Rock Mill (WYW172386)	T 29 N, R 91 W	Sec. 6, lots 5, 8 through 13, inclusive, E1/2SE1/4, SW1/4SE1/4, SE1/4NW1/4; Sec. 7, lots 3 and 4, E1/2SW1/4, SW1/4SE1/4; Sec. 18, lot 1, NE1/4NW1/4	749.09
	T 29 N, R 92 W	Sec. 1, lots 1, 2 and 4, S1/2NE1/4, SW1/4, W1/2SE1/4, SE1/4SE1/4; Sec. 2, SE1/4SW1/4, SW1/4SE1/4, NE1/4SW1/4,	

Mill Site	Township/Range	Section(s)	Acreage ¹
		S1/2SW1/4, SE1/4; Sec. 3, SE1/4SE1/4; Sec. 11, ENTIRE SECTION; Sec. 12, ENTIRE SECTION; Sec. 13, N1/2; Sec. 14, NE1/4, NE1/4NW1/4	
Pathfinder – Lucky Mac Mill (WYW161764)	T 33 N, R 90 W	Sec. 9, lots 1 and 2, and NE1/4SE1/4; Sec. 10, lots 1 through 3, inclusive, NW1/4, W1/2SE1/4, and that unpatented portion of Mineral Survey No. 644 lying within sec.10; Sec. 15, lots 1 through 8, inclusive, S1/2NE1/4, NW1/4NE1/4, N1/2SE1/4, SE1/4SE1/4, and those unpatented portions of Mineral Survey Nos. 587 and 644 lying within sec. 15; Sec. 21, E1/2NE1/4, and NE1/4SE1/4; Sec. 22, lots 1 through 4, inclusive, NE1/4NE1/4, and those unpatented portions of Mineral Survey Nos. 582, 584, and 587 lying within the N1/2, NW1/4SW1/4 and N1/2SE1/4	1,091
Umetco – East Gas Hills Mill (WYW164606)	T 33 N, R 89 W	Sec. 9, SE1/4; Sec. 10, S1/2; Sec. 15, N1/2, SE1/4SE1/4; Sec. 21, NE1/4; and Sec. 22, N1/2	1,320
American Nuclear – Gas Hills Mill	T 33 N, R 93 W	Unknown, under Wyoming DEQ reclamation responsibility	Unknown
Source: BLM 2009b ¹ Values shown are for public surface (any additional subsurface mineral estate not included). DEQ Department of Environmental Quality E East N North NE Northeast NW Northwest R Range Sec. Section S South SE Southeast SW Southwest T Township W West			

Locatable – Gold

Gold deposits are typically found in the planning area in two forms, lode and placer. These gold deposits are found in varied geologic settings. In the South Pass/Atlantic City area, most of the lode gold is orientated along shear zones trending east-northeast in a suite of granitic and metamorphic rocks, including banded iron formation, quartzite, schist, and other rocks referred to

as greenstone. Placer deposits are found in streams which are mostly sourced in the Wind River Range. Two Tertiary-age paleoplacer deposits have also been identified in the vicinity of the South Pass/Atlantic City District. These include the Dickie Springs-Oregon Gulch paleoplacer and the Twin Creek conglomerate. These placers are notable because they could represent the greatest potential for a major gold accumulation in the planning area. The Dickie Springs placer also extends into the administrative boundaries of the BLM Rock Springs Field Office. Additional placer activity in the Red Canyon area was part of the early development of the South Pass deposits and was supported by irrigation ditches bringing water into Red Canyon.

The Rattlesnake Hills District is north of the Granite Mountains on the north side of the east-west trending North Granite Mountains Fault, and encompasses an area of approximately 150 square miles. This area includes more than 40 discrete volcanic vents and igneous bodies of Eocene age. The Rattlesnake Hills were formed by a northwest plunging anticline of Laramide age, cored by Precambrian rocks, and intruded by Tertiary igneous rocks (Hausel 1989). Apparently, there are some precious metals in the Precambrian metamorphic rocks, which also include band iron formations. Jasperoid rocks are also reported in the area, which is important because jasperoid is a well-known mineralization indicator rock in other mining districts, especially in the Great Basin of Nevada. In 1981, the Wyoming State Geological Survey discovered important gold anomalies in the Rattlesnake Hills District.

Additional information on gold in the planning area can be found in the *Final Mineral Occurrence and Development Potential Report* (BLM 2009b).

Gold Mining and Exploration Activities

Mining operations for precious metallic ores, particularly gold, has a long and varied history in the planning area. The most well known district is the South Pass/Atlantic City area. Metals mining districts of lesser prominence include the Lewiston District, the Granite Mountains, the Copper Mountains, and various placers on streams mostly sourced in the Wind River Range (Hausel 1989). At present, most of the mining activity in the South Pass/Atlantic City area is recreational.

The South Pass/Atlantic City District lies along the northwestern flank of the South Pass Precambrian greenstone belt and has been Wyoming's most prolific source of gold and iron ore (Hausel 1989). Gold was discovered here in the 1860s, touching off a gold rush in 1867 that resulted in more than 1,000 inhabitants settling in South Pass City. By 1872, only a few hundred people remained and the boom was over. Optimistic estimates of the total gold production in the district range as high as 334,000 ounces (Hausel 1987). Historically, approximately 50 mines were in operation at one time or another. However, most gold mining efforts in the district met with disappointment, although several did produce for a number of years. Most of these mines had total gold production amounting to a little over a few hundred ounces. Little is known about ore grades in the district and most available figures vary. In the 1970s, several properties were explored with modern methods, with numerous boreholes drilled at both the Carissa and Duncan mines. Although the boreholes did intersect zones of gold mineralization, the grade and areal extent of the mineralization was apparently not sufficient for additional development. The State of Wyoming purchased the Carissa Mine for historical purposes; the state is performing stabilization work and has plans for public access and onsite interpretation. Although its future status appears to be settled, the Carissa Mine areas host some of the more promising possibilities for gold mineralization in the district (Hausel 2004). Most of the mines in the district are now undergoing AML reclamation and/or preservation. Several properties remain privately owned and are open to operation at little more than a hobbyist's level.

Modern stream placers in the South Pass/Atlantic City District were relatively productive and may have recovered up to 100,000 ounces of gold (Hausel 1989). Principal placers include Rock Creek, Meadow Gulch, and Yankee Gulch.

The South Pass/Atlantic City Mining District has seen no major change in mining-related activities over the last planning cycle, and continues to experience several hundred visitors engaged in casual use mining activity (surface panning and sluicing). Many people converge on the area during summer to stake claims and try their hand at recreational gold panning. Several clubs operate claims in the South Pass area for the sole use of their members, and these activities do result in recoverable amounts of gold dust, flakes, and small nuggets. In addition, small operators explore for gold or take bulk samples using backhoes. There is some management concern in the South Pass area about the cumulative impact of these activities. To date, there has been little interest in other potential placer deposits in other Wind River Mountain locations.

Increased interest in the Rattlesnake Hills District by several major gold mining companies began with a limited surface and drilling program between 1983 and 1987, and again by another company from 1993 to 1995. This activity led to several discoveries, including a large-tonnage, low-grade deposit that has the potential to host more than 1 million ounces of gold (WSGS 2002). Subsequent drilling by the latter company targeted diatreme breccias, which border one of the alkali stocks in the area. Gold grades reported by the company ranged up to 485 feet averaging 0.07 ounce per short ton, with higher-grade intervals over narrower widths.

The potential for gold uncovered thus far in the Rattlesnake Hills District has resulted in a third company taking options on approximately 2,600 acres of claims. This company filed a mining notice under 43 CFR 3809 with the Lander Field Office and started a drilling program in the summer of 2008. Preliminary results indicate that drilling during the summer 2008 drilling program intersected anomalous values of gold in two core holes 65 meters (approximately 213 feet) apart (BLM 2009b). As of 2009, the company is operating an expanded core-drilling project under a BLM-approved Plan of Operations. If mined, it is anticipated that this deposit would be mined by either surface (open pit) or underground mining methods, in contrast to the panning, sluicing, and backhoe methods employed in the South Pass/Atlantic City area.

Locatable – Bentonite

Bentonite is an aluminum phyllosilicate, essentially a type of impure clay usually formed from the weathering of volcanic ash, most often in the presence of water. Bentonite deposits were formed from the alteration of volcanic ash deposited primarily during the Cretaceous Period. This volcanic ash was deposited into the epeiric seas that covered much of Wyoming, forming sediments as much as 50 feet deep. The weathering and alteration of these sediments formed the clay (bentonite). Bentonite is widespread in the planning area and primarily occurs as discrete beds within shales and sandstones, most notably the Cretaceous Mowry Shale, the Frontier Formation, and the Eocene Wind River Formation. Bentonite is able to absorb large amounts of fluid and is used for absorbents, animal feed, drilling fluids, foundry, iron ore pelletizing, sealants, pet litter, crayons, medicines, food thickeners, cosmetics, and other applications. The absorptive and adsorptive properties of bentonite give it a high swelling potential that is useful in a wide variety of industries, such as drilling muds, cosmetics, and pharmaceuticals (Thorson 1983).

Bentonite Mining and Exploration Activities

Bentonite deposits of the Wind River Basin and in the planning area are found in a wide variety and quality. Typically, the most economically viable deposits are found in the Upper Cretaceous

Frontier Formation and the Lower Cretaceous Mowry and Thermopolis Shales (Gersic 1993). Several beds 1 to 5 feet thick of low-to high-grade ore occur throughout the 300-foot thick Upper Thermopolis Shale and 400-foot thick Mowry Shale (Thorson 1983). The most abundant and valuable bentonite beds occur within the Mowry Shale (Hausel and Holden 1978). Just above the contact between the Mowry Shale and Frontier Formation, a bed of 2- to 5-foot thick, high-grade bentonite can almost consistently be found throughout most of Wyoming. Bentonite exploration is ongoing in the planning area, targeting certain beds in the Cretaceous Mowry and Frontier Formations.

The bentonite throughout the Wind River Basin is classified as montmorillonite clay and consists of very fine-grained, gray to white, plate-like minerals high in sodium content (Hausel and Holden 1978). This sodium-rich bentonite is considered unique to Wyoming.

Because of the variability in quality of bentonite, the mere presence of bentonite beds does not constitute commercial value. Bentonite must be determined to meet specific industry standards through testing of its chemical and physical properties. Not only is quality an important factor in economic potential, but quantity must be taken into account as well. Typically, bentonite is mined at the surface where bed thickness exceeds 24 inches and the overburden-to-ore ratio is equal to 6:1 or less. In certain conditions, mining can occur on 35-degree dipping beds at a depth of up to 60 feet, but the average ratios being mined today are 4:1 with dips usually less than 15 degrees (Thorson 1983).

Mining of bentonite in the planning area has been limited to reserves found in the Gas Hills, 35 miles east of Riverton, Wyoming. This mine uses shallow surface mining methods to strip thin beds from the upper Mowry Shale known locally as the Beaver Beds. These beds dip at 5 to 15 degrees north/northeast and are mostly available at the surface, so there is minimal waste rock or overburden. At present, there are no commercial bentonite mining operations in the planning area. One bentonite mine, in the Gas Hills area, has an approved Plan of Operations and holds a mine permit from the Wyoming DEQ. The mine facility came online in 2010.

Various sampling and testing has been conducted on mining claims for bentonite throughout the planning area, including the Twin Creek and Lander Slope areas to the south and southwest of Lander, Wyoming. The beds tested in this area are typically found at the contact of the Mowry Shale and Frontier Formation.

Bentonite beds crop out along all four margins of the Wind River Basin, but often dip too steeply for mining (Hausel and Holden 1978). Because of the folding associated with the uplifted Wind River Range to the west, the Mowry Shale and Frontier Formation are generally found as east-dipping beds between 5 and 30 degrees; however, an anticlinal fold known as Dallas Dome has repeated this section of bentonite-bearing formations along the Lander Slope and created nearly vertical dipping beds as well. From discussions with operators in this area, this bentonite does not have the economic qualities or quantities found in the Gas Hills.

According to Gersic (1993), testing of beds in the Mowry Shale and Frontier Formation exposed along the same structural complex adjacent to the Wind River Mountains as the Twin Creek/Lander Slope area, showed overall poor quality compared to bentonite produced elsewhere in Wyoming.

Management Challenges for Locatable Minerals

There are considerable management challenges associated with locatable minerals mining in the planning area. The primary management challenges are associated with surface disturbance resulting from mining activities and impacts to other resources and resource uses from locatable mineral mining. There are also management challenges associated with reclamation of historic mining activities, mixed land ownership patterns, mining in special designation areas, and trespass issues associated with locatable minerals mining.

The greater sage-grouse is a candidate species for listing under provisions of the Endangered Species Act (ESA) (USFWS 2010). The BLM, in coordination with other federal and state agencies, local government, local working groups, and public land users, is taking measures to conserve greater sage-grouse habitat and populations. Some areas with locatable mineral development potential (especially areas with uranium potential) in the planning area lie within high quality habitat for the greater sage-grouse. Therefore, the BLM faces challenges managing locatable mineral development while protecting greater sage-grouse habitat.

Holders of grazing permits and leases on public lands can be affected by locatable mineral operations taking lands out of production short- or long-term. Surface disturbance necessary to extract locatable mineral resources can directly reduce the availability of livestock forage until either interim or final reclamation of mineral operations is completed. Such reductions can range from minor acreage related to a single drill hole, to hundreds of acres related to surface mining or milling. In the case of open pit mining, “reclamation” may involve protection of water quality but not the replacement of vegetation, so that the area is permanently lost as grazing and browsing habitat. This may be observed in the former iron mine on Highway 28 between South Pass and Red Canyon or the old uranium mines and mill sites that do not support vegetation.

Several mining districts in the planning area, such as the South Pass/Atlantic City and Copper Mountains, are undergoing extensive reclamation of historic surface disturbance under the Wyoming DEQ, AML Division. Many of these mining districts contain historic mining features worthy of preservation. However, some of the areas undergoing reclamation and immediately adjacent lands have some potential for the presence of gold and other locatable minerals, thus generating interest in exploration under the Surface Management Regulations (43 CFR 3809). These issues pose management challenges for the disposition and future management of such lands. The need to restore and clean up mines associated with previous mining activities and a limited amount of funds provided for the AML program pose additional challenges associated with historic mining and reclamation of mines.

The land ownership pattern in the planning area consists of mixed ownership between BLM-administered lands, the WRIR, state trust lands, private lands, private surface overlying federal mineral estate, National Forest System Lands, and lands managed by the Bureau of Reclamation. Management of locatable mineral operations becomes more complex where projects are proposed in areas of mixed ownership. In addition, segregations and withdrawals of public lands from operations under the General Mining Law, including those segregated in preparation for withdrawal and transfer to DOE (see the discussion of mill sites under the uranium sub-section above) add to management complexity, especially when addressing valid existing rights.

Additional management challenges for locatable minerals mining in the planning area include locatable mineral operations within special management areas such as ACECs and NHTs. Allowing operations in these specially designated areas and mitigating impacts to the areas consistent with management objectives are a management challenge in the planning area. Trespassing of public pursuing unauthorized mining (beyond scope of staking or without

staking) and “claims” being asserted without meeting the ongoing activities required by the 3809 Regulations are an additional management challenge in the planning area.

3.2.2. Leasable Minerals – Coal

At present, there is no coal leasing in the planning area and no anticipated development of coal resources during the planning cycle. Future coal leasing and development in the planning area would require an RMP amendment.

3.2.3. Leasable Minerals – Geothermal

Geothermal resources are typically underground reservoirs of hot water or steam created by heat from the Earth. Geothermal energy is produced when this steam or heat is used to turn a turbine to create electrical energy. Geothermal steam and hot water naturally discharge at Earth’s surface in the form of hot springs, geysers, mud pots, or steam vents. Geothermal resources also include subsurface areas of hot, dry rock. The Lander Field Office is responsible for supervising and managing all exploration, development, and production operations on any federal geothermal leases in the planning area.

There are two main categories of geothermal energy systems. Hydrothermal systems occur where water or steam is the primary carrier of the associated energy, and “dry” systems occur where hot, water-free rocks and magma are the energy sources. While dry environments are also the primary mechanism from which the hydrothermal environments derive their heat, existing technology used to exploit these dry environments for energy use is in the experimental phase and such extraction is usually not economically viable.

Warm water systems and normal temperature systems are hydrothermal systems typically used for site-specific and residential scale applications (direct use). Electrical grade geothermal energy comes from hydrothermal systems, which can generate electricity via geothermal fluids used to drive turbines. Electrical grade systems must have relatively high temperature fluids (liquid and/or vapor water) to efficiently drive the turbines. As technology has evolved, the temperatures required have become lower, but generally must still be more than 300 degrees Fahrenheit (°F) (Duffield and Sass 2003).

The Final Programmatic Environmental Impact Statement (PEIS) for Geothermal Leasing in the Western United States (October 2008) evaluates various alternatives for allocating lands as being closed or available for geothermal leasing and analyzes stipulations to protect sensitive resources. The Record of Decision (ROD) for the Geothermal PEIS (December 2008) amended existing land use plans to facilitate geothermal leasing on federal mineral estate in the planning area. The PEIS allocated 1,201,201 acres of BLM-administered surface as open to geothermal leasing in the planning area and 32,423 acres as closed (BLM and USFS 2008). Areas for discretionary and nondiscretionary closures as identified in the PEIS that are applicable in the planning area include:

- WSAs
- ACECs
- Areas previously closed to fluid minerals development in approved land use plans
- Lands in the BLM National Landscape Conservation System, such as National Historic and Scenic Trails

The Lander Field Office has determined that the acreage in the PEIS do not accurately reflect the components of the National Landscape Conservation System (NLCS) in the planning area. In addition, the PEIS did not provide a buffer for the excluded lands which creates planning difficulties, particularly in association with the Congressionally Designated Trails.

Geothermal Activity

There are geothermal resources in many places in the planning area, as evidenced by flowing springs with elevated groundwater temperatures. There are several areas where measured temperature gradients in groundwater wells indicate the potential for low- or medium-grade geothermal energy. These areas include north of the Gas Hills, the Diamond Springs area, Big Sand Draw, and the Copper Mountain area. Table 3.19, “Thermal Springs in the Planning Area” (p. 333) lists known thermal springs in the planning area. None of these thermal springs met the criteria to be included in the inventory of hot and warm springs included in the Geothermal PEIS (BLM and USFS 2008).

Table 3.19. Thermal Springs in the Planning Area

Thermal Spring	Location	Temperature (°C)	Flow (liters per minute)
Warm Springs Creek Springs	T 42 N, R 107 W	29	503
Little Warm Springs	T 41 N, R 107 W	25	2120
Jakey’s Fork Spring	T 41 N, R 106 W	20	15
Conant Creek Springs	T 33 N, R 94 W	16	1136
Sweetwater Station Spring	T 29 N, R 95 W	32	1890
Horse Creek Springs	T 32 N, R 86 W	24	8327
Fort Washakie Hot Springs	T 1 S, R 1 W	44	568
Source: Heasler et al. 1983			
°C degrees Celsius			
N North			
R Range			
S South			
T Township			
W West			

There are no active or pending federal leases for geothermal facilities in the planning area and no likely development of utility scale geothermal resources. There are areas in the planning area with low potential for geothermal development for direct use applications from warm water and normal temperature systems, but not for utility scale application (Map 16). These low potential areas occur around thermal springs and in areas with anomalies in the subsurface temperature gradient. Low potential areas are considered to have some potential for future exploration, but due to the expected nature of future projects (small, direct use systems) it is not likely that there would be any substantial development (BLM 2009d).

Areas with very low potential for geothermal development in the planning area are underlain by aquifer waters with temperatures in excess of approximately 120°F, and those deemed favorable for shallow, direct heat development (Map 16) (BLM 2009d). These waters, while too cool for electrical generation, might still be utilized for direct use systems, although less effectively than geothermal areas associated with thermal springs (low potential areas).

Areas with negligible geothermal potential represent the remainder of the planning area (Map 16). The entire planning area is underlain by rocks with temperatures in excess of approximately

300°F at an average depth of approximately 24,600 feet. As a result, the entire planning area might be suitable for future deep enhanced geothermal development as the technology for such systems improves. However, at present, these types of projects are not economically feasible and this type of geothermal development is the least likely to occur in the planning area.

The most likely potential for utilization of geothermal resources in the planning area is for co-generation, such as with oil and gas development. Low potential geothermal resources are more viable if a developer is already drilling to reach differentially heated material. Coupled with new low temperature equipment, electrical power to operate facilities could be generated without carbon dioxide (CO₂) or other emissions. Direct heat application could be used to warm gas lines and other facilities associated with minerals development. As clean energy initiatives increase and oil and gas operators look at ways to reduce the emissions impacts of their projects (and potentially to make projects more affordable), utilization of direct use geothermal systems on public land in the planning area might increase.

Additional information on Geothermal Resources and potential development in the planning area can be found in the *Reasonable Foreseeable Future Development Scenario for Geothermal for the Lander Field Office Planning Area* (BLM 2009d).

Management Challenges for Geothermal Development

Due to the lack of activity and absence of geothermal leasing in the planning area, no management challenges have been identified.

3.2.4. Leasable Minerals – Oil and Gas

Oil and gas occurs in the planning area in numerous geologic formations, and members of formations that range in age from the oldest producing formation (Flathead Sandstone of Cambrian age) upward to the Wind River Formation of Tertiary age. The two oil and gas basins in the planning area are the Wind River Basin and a small portion of the northern part of the Great Divide Basin. In addition, CBNG being produced in the planning area originates from coals in the Mesaverde Formation.

The Wind River Basin is a west-east trending asymmetrical intermontane basin of the Rocky Mountain Foreland, located in central Wyoming. The Wind River Basin Province is approximately 200 miles long and 100 miles wide, encompassing an area of approximately 11,700 square miles. Province boundaries are defined by fault-bounded Laramide uplifts that surround it. These include the Owl Creek Mountains to the north, Wind River Mountains to the west, Casper Arch to the east, and the Sweetwater Uplift to the south.

Two source rock and associated oil and gas reservoir systems appear to be responsible for most of the hydrocarbons found in the planning area. Permian aged Phosphoria source rocks appear to have sourced most of the pre-Cretaceous-aged reservoirs in the planning area (Kirschbaum et al. 2005). These older formations have predominately produced oil with smaller amounts of gas; the Madison Limestone, which has produced mostly gas in the Madden Field, is the exception. Tertiary and Cretaceous aged source rocks appear to have been the source of hydrocarbons in most Tertiary and Cretaceous aged reservoirs. The lower shaly member of the Cody Shale is a fair to excellent source rock for both oil and gas, and it is the most organic-rich and oil-prone of all potential hydrocarbon source rocks in Cretaceous strata in the Wind River Basin (Finn 2007). In

the Tertiary and Cretaceous aged reservoirs, gas production tends to predominate, although there is usually a substantial oil component produced along with the gas.

Up until 2004, evidence for CBNG potential within the planning area has been limited to perhaps five exploration targets, generally in the Mesaverde Formation, with less than 5,000 feet of overburden (De Bruin and Jones 1990). The steeply dipping Lance and Meeteetse coalbeds in the Waltman area of the Wind River Coal Field might present additional targets for CBNG development. The Fort Union Coals are targets for CBNG development in the Great Divide Basin portion of the planning area.

Statutory and Regulatory Authorities

The Mineral Leasing Act of 1920, as amended, provides that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. However, it is important to note that lease issuance by the Secretary of the Interior, through the BLM, is discretionary. With reasonable basis, the BLM can control the geographic location and timing of lease parcels it offers. The agency can also add lease stipulations to the standard lease terms and conditions, which can impose additional limits on the timing and methods of drilling for oil and gas.

Leasing procedures for oil, conventional natural gas, and CBNG are the same (see 43 CFR 3101). Based on the Federal Onshore Oil and Gas Leasing Reform Act of 1987, all leases must be exposed to competitive interest. Lands that do not receive competitive interest are available for noncompetitive leasing for a period not to exceed two years. Competitive sales are held at least quarterly and by oral auction.

Competitive and noncompetitive leases are issued for a primary term of 10 years. If the lessee establishes hydrocarbon production, the competitive and noncompetitive leases can be held for as long as oil or gas is produced. At the leasing stage, the Lander Field Office applies appropriate stipulations on federal oil and gas leases, including standard oil and gas stipulations (Appendix N (p. 1601)), as well as special stipulations identified in the RMP.

The federal government receives yearly rental fees on nonproducing leases. Royalty on production is received on producing leases, of which approximately one half (48 percent in 2009) is returned to the State of Wyoming.

The general policy and main objectives of the BLM oil and gas program are to foster a fair return to the public for its resources, to ensure activities are environmentally acceptable, and to provide for conservation of the fluid mineral resources without compromising the long-term health and diversity of the land.

In 2010, leasing reform was instituted. One component of the reform was to identify areas where pre-leasing management in the form of Master Leasing Plans (MLPs) would be instituted to protect identified resource values with additional management to standard stipulations. Resource protections in MLPs serve to reduce conflicts between oil and gas development and other resource values. Additional information regarding the areas proposed for management with MLP areas are identified in Chapter 2, both in the section *Alternatives Considered but Not Carried Forward for Detailed Analysis* and in the *Detailed Description of Alternatives by Resource* section. The *Oil and Gas Master Leasing Plans* subsection below discusses MLPs in more detail.

History of Oil and Gas Development in the Planning Area

Oil and gas development in the planning area has a long history that has contributed to economies at the local, state, and national levels. The first oil well in the state was drilled in the planning area in 1884. That well was the discovery well for the Dallas Field, which still produces. Later, two additional wells were drilled on the same structure producing oil from the Phosphoria Formation, with 53 additional wells in the same formation soon following (BLM 2009c). In 1930, a well was drilled producing oil from the Tensleep Sandstone, resulting in the extension of a number of previously drilled Phosphoria Formation wells into the Tensleep (BLM 2009c). Additional natural oil seeps were discovered at a number of sites northwest of the Dallas Field on WRIR lands. Oil fields were later developed on most of these sites.

Most of the fields found prior to 1947 were discovered by surface observations of oil seeps and/or surface mapping (BLM 2009c). These include the Lander, Plunkett, Sage Creek Anticline, Pilot Butte, Winkleman, Maverick Springs, Big Sand Draw, Alkali Butte, Derby, Circle Ridge, Bison Basin, Crooks Gap, Sheep Creek, Muskrat, Muskrat East, and Dubois fields. From 1938 through 1959, additional exploration methods, including mapping of surface geological structures, seismic surveys, and some subsurface mapping led to the discovery of the Beaver Creek, Steamboat Butte, Sheldon, Sand Draw South, Antelope Springs East, Longs Creek, Riverton Dome, Happy Springs, Sand Draw North, Kirby Draw, Grieve, Kirk, Sheldon Northwest, Mt. Rogers Unit, Lost Cabin, Castle Garden, Rolff Lake, Little Dome, and Dolis Hills fields in the planning area.

With increasing data obtained from drilled wells, subsurface stratigraphic mapping began to contribute to exploration for new production. In the planning area, the earliest use of subsurface stratigraphic mapping appears to have aided in the discovery of the Frenchie Draw and Dinty Moore Reservoir fields in 1961, the Bonneville Field in 1968, and the Madden Field in 1968 (Wyoming Geological Association 1989). The first producing formation in each of these fields was the Fort Union. This method was also used in combination with geophysical methods (seismic surveys) in three of the four discovery cases.

Technological Advances in Oil and Gas Development

The U.S. oil and gas industry has historically relied on continuous improvements in technology to better understand oil and gas resources and to find and extract these resources. Innovative drilling and completion techniques have enabled the industry to drill fewer dry holes and to recover more oil and gas reserves per well. Smaller accumulations once thought to be uneconomical are now being produced. Technological improvements have also allowed fewer wells to be drilled per acre to develop oil and/or gas resources in some cases. Increased drilling success rates have cut the number of wells drilled and dry holes (DOE 1999). The Energy Information Administration has projected the increase in percentage of wells drilled successfully will be 0.2 percent per year to 2030 (EIA 2007a).

From the early 1990s to present, oil and gas activity in the planning area has focused almost entirely on very low risk development drilling in and around known field areas, which helped to improve the overall success rate. More future exploratory drilling would be required to discover new resources in the planning area and to determine if the potential CBNG resource is economical to produce. Because the risk of failure is higher for these types of activities, success rates could decline slightly in the future.

Advances in technology have boosted exploration efficiency, and additional future advances would continue this trend. Substantial progress has been made and is expected to continue in the following:

- Computer processing capability and speed
- Remote sensing and image-processing technology
- Developments in global positioning systems
- Advances in geographical information systems
- Three-dimensional and four-dimensional time-lapse imaging technology that permits better interpretation of subsurface traps and characterization of reservoir fluid
- Improved borehole logging tools that enhance understanding of specific basins, plays, and reservoirs
- Advances in drilling that allow more cost-efficient tests of undepleted zones in mature fields, testing deeper zones in existing fields, and exploring new regions

New technologies would likely allow companies to target higher-quality prospects and improve well placement and success rates. As a result, fewer drilled wells would be needed to find a new trap, and total production per well would increase (DOE 1999). Also, drilling fewer wells would reduce surface disturbance and volumes of waste, such as drill cuttings, drilling fluids, and produced water. An added benefit of improved remote sensing technology is the ability to identify oil and gas “seeps” so that they can be cleaned up. These seeps can also help pinpoint undiscovered oil and gas resources.

There have been drilling improvements in new rotary rig types, coiled tubing, drilling fluids, and borehole condition monitoring during the drilling operation. Improvements in technology are allowing directional and horizontal drilling use in many applications. New bit types have boosted drilling productivity and efficiency. New casing designs have reduced the number of casing strings required. Environmental benefits of drilling and completion technology advances include the following:

- Smaller footprints (less surface disturbance)
- Reduced noise and visual impacts
- Less frequent maintenance and workovers of producing wells with less associated waste
- Reduced fuel use and associated emissions
- Enhanced well control for greater worker safety and protection of groundwater resources
- Less time onsite with fewer associated environmental impacts
- Lower toxicity of discharges
- Better protection of sensitive environments and habitat

Technologies such as secondary and enhanced recovery might also be used to revive old fields to a producing status. Oil remaining in existing fields could be targeted by injecting fluids such as water or CO₂ to enhance or increase recovery. For more detailed information on such technologies, see the *Reasonably Foreseeable Development Scenario for Oil and Gas* (BLM 2009c).

Geophysical Exploration

The BLM may permit geophysical operations on federal lands both on and off oil and gas leases. A geophysical operator is required to file with the BLM a Notice of Intent to Conduct Oil and Gas Exploration Operations. Geophysical surveys might include gravity surveys, geomagnetic surveys, and reflection seismic surveys, the latter being the most common method for locating subsurface structures that might contain hydrocarbons.

With reflection seismic surveys, seismic (shock wave) energy is induced into earth using one of several methods at a location called a source point or shot point. As the waves travel downward and outward, they encounter rock strata that transmit seismic energy at different velocities. Sensing devices, called geophones, are placed on the surface to detect these reflections of energy. The end product of the seismic processing is a seismic section that presents the strata or structures below the surface. Most common is the two-dimensional survey, so called because the data yield a two-dimensional model of the subsurface being analyzed. A variation of this technique is the three-dimensional seismic profile survey. The methods of generating the seismic waves are the same as those used in conventional seismic surveys. This type of survey differs from the more common two-dimensional survey in the greater number of data points and the closer spacing of the lines. See the *Final Mineral Occurrence and Development Potential Report* for a more complete description of geophysical exploration methods (BLM 2009b).

Historically, two-dimensional seismic surveys have been conducted over large parts of the planning area. The Wind River Mountains along the western side and the Absaroka Range on the northwest side have not had recent seismic surveys. Three-dimensional surveys have been less widespread in the planning area. Recent three-dimensional surveys have been conducted in the central part of the planning area.

Oil and Gas Activity

Through the end of 2007, there were 1,566 active wells and 1,628 inactive wells in the planning area (BLM 2009c). Almost all planning area drilling activity (exploratory and development) has been occurring in the eastern Wind River Basin and eastern portions of the WRIR, with additional exploratory activity in the Great Divide Basin portion of the planning area.

New wells drilled in the last 10 years are concentrated in the northeast part of the planning area (mainly at the Madden, Frenchie Draw, Fuller Reservoir, and Beaver Creek fields) and in the southeastern part of the WRIR (at the Muddy Ridge, Pavilion, and Riverton Dome fields), with a few new oil wells drilled in the northwest and occasional new wells scattered across the south (Map 33). Of the 719 development wells completed in the last 10 years, 93.7 percent were successful.

Oil and Gas Master Leasing Plans

Subsequent to the start of the RMP revision process, the BLM issued guidance regarding MLPs to address oil and gas leasing in areas with resource values of concern; see IM 2010–117. The BLM received nominations for five areas in the planning area (either in whole or in part) for which MLPs were requested. BLM guidance requires land use plan revisions to analyze MLP proposals. The Wyoming State Office of the BLM determined that three of these areas did not meet the requirements of IM 2010–117. Of the two remaining areas, the Dubois area was also later dropped from analysis as an MLP after it was determined that the alternatives already incorporated the kinds of protections for the resource values in Dubois that would be afforded under an MLP, and as such the effect of an MLP was fully considered. These four areas are discussed in greater detail in the *Alternatives Considered but Not Carried Forward for Detailed*

Analysis section in Chapter 2. The remaining area, Beaver Rim, was the only area identified for further analysis as an MLP in the RMP revision.

The citizens' nomination for the Beaver Rim area did not provide specific mapped location information. The BLM originally identified an area below Beaver Rim to the east of Highway 135 (the Sand Draw Highway) as the proposed area. On further analysis and after consultation with the nominating group, the location of the proposed Beaver Rim MLP analysis area was further refined to identify lands with resources that could be protected with an MLP. These lands were identified as being east of Sand Draw Highway and following the edge of the Rim eastward. These lands contain Native American sacred sites and important visual resources. The topography of the area is such that surface disturbances such as oil and gas and other mineral development could be highly visible and would present a sharp contrast with the surrounding areas. The southern boundary is immediately to the north of the swath of land that makes up the visual setting for the NHTs. The importance of the visual resources in the area stems from the geologic features of the Rim (and the Native American concerns that arise because of the Rim's visual importance) and nearby setting of the NHTs. The area also lies within greater sage-grouse Core Area, as does all of the land on top of the Rim up to the Granite Mountains.

The Beaver Rim area has the only known locations of Yermo (a species listed as threatened) in the world. The two Yermo sites are managed as open to oil and gas leasing subject to no surface occupancy (NSO) stipulations. In addition, there are a number of unique plant communities including types of trees and shrubs that would not be anticipated from the type of vegetation found in the surrounding areas of sagebrush steppe. The small pockets of vegetation vary in size from a half acre to several acres and contain Douglas-fir, limber pine (a BLM-sensitive species), juniper, and cottonwood.

The vast majority of the Beaver Rim has not experienced surface disturbance. However, there are current resource uses that present potential conflicts with other resource values. An existing communication site is present along with two major ROWs: a pipeline corridor running northwest to southeast and an above ground utility corridor that runs along the Jeffrey City Haul Road. There are some areas that are leased for oil and gas that contain wells that have been producing for many years. These leases are located primarily in the north western most portion of the area and extend into the most visually sensitive areas. The current level of disturbance is at a very low threshold, but the existing authorized uses raise the level of potential resource conflict.

While Beaver Rim continues as a geologic feature across the planning area, the area changes in character and values near the Haul Road (also called the Jeffrey City to Gas Hills County Road). At this point, the Rim is less prominent and although Native American sites are common, they are less important than further west. The Haul Road is the approximate western edge of the historic uranium district both above and below the Rim.

Oil and Gas Leasing

In the planning area as of June 2009, there were approximately 994,123 acres of leased federal oil and gas mineral estate and approximately 1,814,978 acres of unleased federal oil and gas mineral estate (Map 33) (BLM 2012a). Federal oil and gas leases are incorporated into 35 active unit agreements that lie within or partly within the planning area. Twenty-one companies operate the 35 units. Unique rules apply to unitized leases, which are exempt from state spacing rules. The oldest active unit is the Big Sand Draw Gas unit established in 1934 (BLM 2009c).

Areas are either open or closed to oil and gas leasing. If open, an area may be offered subject to major constraints such as NSO, moderate constraints such as timing limitations, or subject to standard lease stipulations. As indicated above, Washington Office Leasing Reform introduced the MLP concept as part of BLM oil and gas leasing. MLPs expand the tools available to the BLM to address resource conflicts prior to leasing and make a finer scale analysis on identified smaller areas than the entire RMP planning area. Although this guidance was issued late in the development of the alternatives, the MLP tool is very similar in its approach to controlling the amount and kind of surface uses that were evaluated in developing the alternatives based upon current condition and identified conflicts between resource values and leasing. See Chapter 2 for further discussion regarding MLP management.

Oil and Gas Production

The most prolific oil productive formations have been the Phosphoria Formation and Tensleep Sandstone. A substantial amount of gas production has also been associated with these two formations. Almost all of the fields producing from these two formations are within the boundaries of the WRIR, with some additional productive fields to the south and southeast of the WRIR.

The Fort Union Formation and Madison Limestone, at the Madden field have been the most prolific gas producers within the planning area. A moderate amount of oil has been produced in association with the gas in the Fort Union Formation wells, while associated oil production in the Madison Limestone has been moderate from other fields such as Beaver Creek. Most of the Fort Union Formation producing gas fields are concentrated in the northeast part of the planning area, within the Madden field (Map 33) containing more than one third of the total wells. The Fort Union Formation has been productive in 737 (23 percent) of the total productive wells in the planning area. Only 61 wells have produced from the Madison Limestone (less than 2 percent of all producing wells), with most wells located at the Circle Ridge and Beaver Creek fields. Although only eight Madison Limestone wells produce at the Madden field, that field accounts for more than 98 percent of all Madison Limestone gas production.

Table 3.20, “Producing Oil and Gas Fields and Cumulative Production in the Planning Area as of the End of 2007” (p. 340) lists producing oil and gas fields and cumulative production through 2007. The major producing gas fields in the planning area (by volume), in descending order, are Madden, Beaver Creek, Pavillion, and Big Sand Draw. The major producing oil fields, in descending order, are Winkelman, Steamboat Butte, Beaver Creek, Big Sand Draw, and Circle Ridge. At the close of 2007, there were 1,566 actively producing oil and gas wells and a cumulative oil production of approximately 502,428,297 barrels of oil and 3,885,146,697 cubic feet of gas.

Table 3.20. Producing Oil and Gas Fields and Cumulative Production in the Planning Area as of the End of 2007

Fields	Producing Zones	Cumulative Gas (thousand cubic feet)	Cumulative Oil (barrels)	Wells	Active Wells	Inactive Wells
Alkali Butte	9	9,379,319	56,919	15	3	12
Alkali Butte North	2	1,654,720	51	2	0	2
Antelope Springs East	2	1,628,096	8,421	3	0	3
Arapahoe Creek	2	76,942	23,674	2	0	2

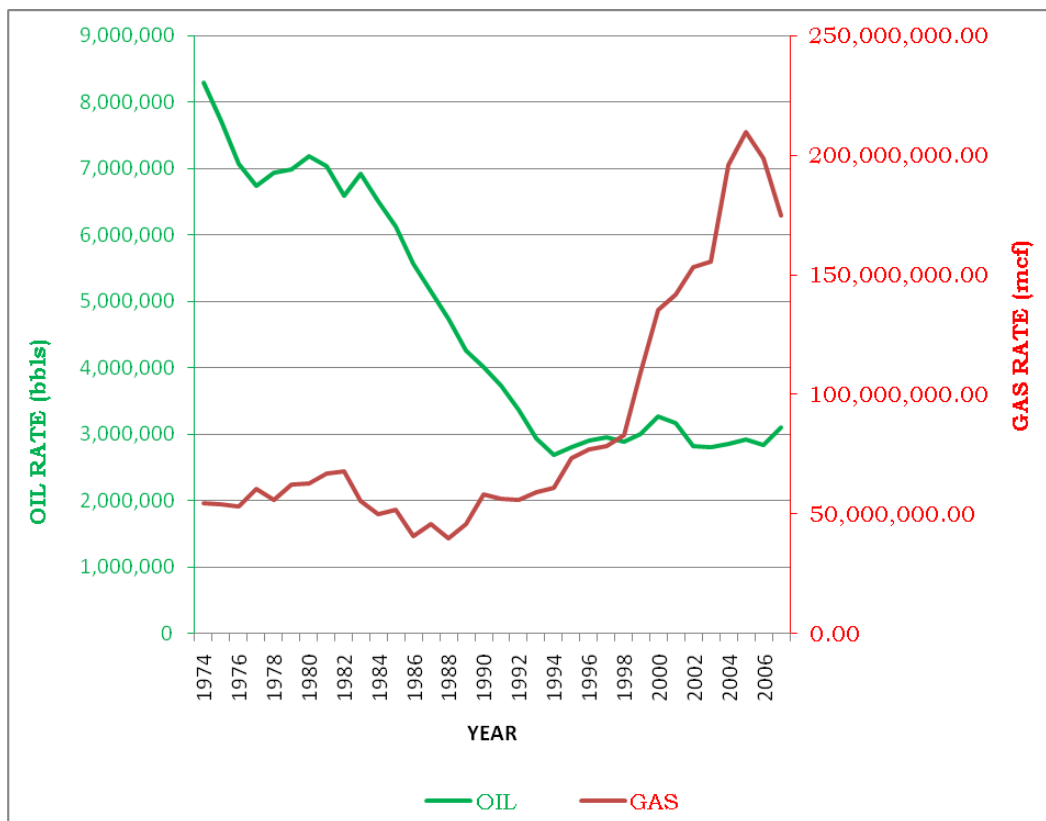
Fields	Producing Zones	Cumulative Gas (thousand cubic feet)	Cumulative Oil (barrels)	Wells	Active Wells	Inactive Wells
Austin Creek	1	1,549,402	353,233	1	1	0
Beaver Creek	17	827,049,315	59,407,755	211	110	101
Big Sand Draw	8	196,902,304	55,515,483	87	35	52
Bison Basin	2	483,160	3,40,2540	38	31	7
Bonneville	3	1,794,895	22,751	9	5	4
Boulder Dome	3	0	11,074	4	0	4
Boysen	3	50,736	630	3	0	3
Campbell Ridge	1	477,663	31,934	2	1	1
Carvner	1	5,600	5,575	1	0	1
Castle Garden	2	5,639,462	12,321	6	5	1
Cedar Gap	1	320,610	1,282	1	0	1
Circle Ridge	14	679	40,336,477	391	111	280
Crooks Creek	1	4,434	0	2	0	2
Crooks Gap	6	1,105,944	7,990,708	30	4	26
Dallas	5	1,021	7,199,703	109	68	41
Day Butte	2	137,468	1,589	3	1	2
Deer Creek II	2	186,243	691	2	0	2
Derby	4	0	1,559,253	48	28	20
Dubois	1	1,555	244,570	9	3	6
Frenchie Draw	3	127,064,636	3,239,555	134	126	8
Fuller Reservoir	2	25,933,280	2,315,223	73	38	35
Gates Butte	1	372,901	2,791	1	1	0
Girard	3	311,411	0	3	0	3
Golden Goose	3	153,954	944,922	5	1	4
Grieve	2	95,649,598	26,580,521	36	3	33
Happy Springs	6	10,921,079	10,365,047	53	9	44
Haybarn	2	1,459,945	350,577	10	6	4
Hoodoo Hills	1	18,373	0	1	0	1
Howard Ranch	1	2,821,385	28,896	1	1	0
Indian Butte	1	21,203	0	1	0	1
Jade Ridge	2	1,015,632	33,090	2	0	2
Kanson Draw	2	1,209,038	4,760	5	1	4
Kirby Draw South	1	74,428	73,428	1	1	0
Kirk	1	0	3,388	1	0	1
Kohler	1	0	83,514	1	1	0
Lander	3	677	20,787,305	273	104	169
Long Butte	4	111,614,511	20	15	7	8
Longs Creek	3	3,682,290	2,031	4	2	2
Lost Cabin	3	2,822,709	508,704	15	6	9
Lost Soldier	1	976,394	483,517	1	1	0
Lysite	5	35,891,852	35,516	7	4	3
Madden	10	1,638,302,619	1,461,492	327	264	63
Maverick Springs	5	37,089	17,376,648	149	32	117
Maverick Springs SE	1	9,247	233,479	7	0	7
Meigh Ranch	1	37,722	163	3	0	3
Moneta Hills	3	1,925,468	94,537	20	10	10
Mount Rogers	1	66,288	0	1	0	1

Fields	Producing Zones	Cumulative Gas (thousand cubic feet)	Cumulative Oil (barrels)	Wells	Active Wells	Inactive Wells
Muddy Ridge	10	125,231,228	509,456	95	62	33
Muskrat	5	20,374,946	105,563	11	1	10
Ocean Lake	1	59,418	3,484	1	0	1
Owl Creek Valley	1	1,035,960	8,463	1	1	0
Paradise Valley	1	282,365	6,469	1	0	1
Pavillion	7	275,617,842	7,617	160	129	31
Picket Lake	2	1,751,580	17,468	7	4	3
Pilot Butte	15	8,769,616	8,683,881	65	23	42
Poison Creek	1	3,634,647	8,428	8	3	5
Popo Agie	1	0	39,322	1	1	0
Riverton	5	3,631,520	1,449,045	6	0	6
Riverton Dome	9	191,340,688	3,796,698	77	44	33
Riverton Dome East	9	74,444,493	218,714	36	10	26
Riverton East	1	6,751,097	22,310	1	0	1
Rolff Lake	3	1,560	1,213,079	11	5	6
Sage Creek North	1	21,011	58,781	4	0	4
Sand Draw North	3	2,294,124	678,743	5	2	3
Sand Draw South	7	9,277,024	3,202,199	32	14	18
Sand Mesa	3	4,840,068	2,093	12	4	8
Sheep Creek	1	0	329,618	10	4	6
Sheldon	11	10,067,592	5,424,313	37	16	21
Sheldon Northwest	8	349,175	2,682,841	30	7	23
Sheldon West	2	6,266	1,761	2	0	2
Shoshoni	2	235,573	342	3	0	3
Squaw Butte	3	801,570	48,333	9	5	4
Steamboat Butte	17	13,449,344	81,260,740	167	54	113
Steffen Hill	4	449,034	0	4	2	2
Unknown	1	0	0	1	0	1
Unnamed	9	3,908,395	56,715	46	25	21
Wertz	2	12,840,976	16,277,939	8	3	5
Wickersham Draw	2	53,159	0	2	0	2
Winkleman	6	2,783,129	118,520,664	212	123	89
Total		3,885,146,697	502,428,297	3,194	1,566	1,628

Source: BLM 2009c

Annual (Figure 3.15, “Annual Oil and Gas Production Rates from Federal, Tribal, Private, and State Wells in the Planning Area” (p. 343)) and cumulative (Figure 3.16, “Cumulative Oil and Gas Production Rates from Federal, Tribal, Private, and State Wells in the Planning Area” (p. 343)) graphs of oil and gas production illustrate historical volume rates and cumulative volumes of oil and gas as a function of time from 1974 through 2007 (BLM 2009c). The rate of oil production declined steadily for a decade starting in 1982 and has been flat since 1993. The rate of gas production was flat up through 1994, experienced a subsequent sharp increase and then began to decline in 2006. In 2006, the Madden field was ranked tenth in the United States by gas

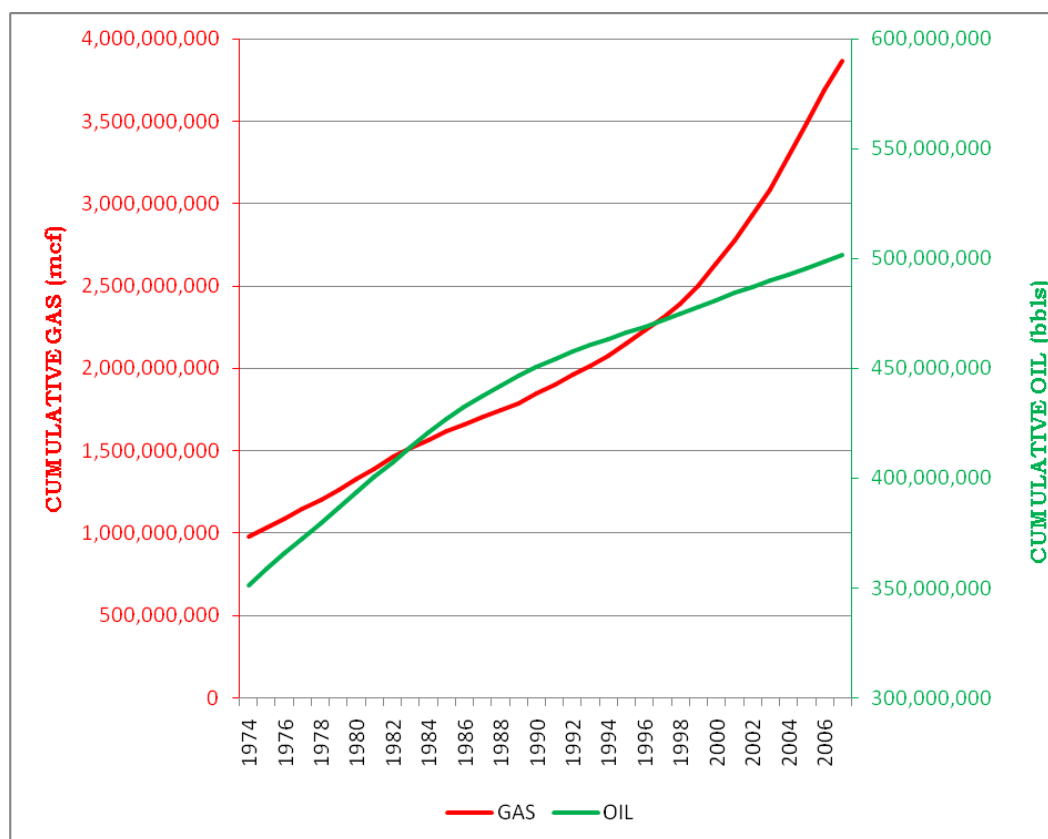
proved reserves and twelfth by gas production (EIA 2007b). See the *Reasonably Foreseeable Development Scenario for Oil and Gas* (BLM 2009c).



Source: BLM 2009c

bbls barrels
mcf thousand cubic feet

Figure 3.15. Annual Oil and Gas Production Rates from Federal, Tribal, Private, and State Wells in the Planning Area



Source: BLM 2009c

bbls barrels
mcf thousand cubic feet

Figure 3.16. Cumulative Oil and Gas Production Rates from Federal, Tribal, Private, and State Wells in the Planning Area

Oil and Gas Resource Estimates in the Planning Area

Table 3.21, “Summary and Estimates of Oil and Gas Resources for the Planning Area” (p. 345) lists projections of the amount of oil, gas, and natural gas liquid resources in the planning area. The estimates of oil and gas resources include portions of the Wind River Basin, Southwestern Wyoming, and Bighorn Basin provinces in the planning area. It is estimated that the planning area contains a mean undiscovered volume of approximately 35.39 million barrels of oil, approximately 3.73371 trillion cubic feet of gas, and 54.55 million barrels of natural gas liquids. The planning area’s oil resource could range from 9.51 to 76.12 million barrels of oil, the gas resource could range from 1.5389 to 5.49116 trillion cubic feet, and natural gas liquids resource could range from 19.55 to 93.62 million barrels of natural gas liquids (BLM 2009c). See the *Reasonably Foreseeable Development Scenario for Oil and Gas* (BLM 2009c) for a more complete summary of the assessment results.

Table 3.21. Summary and Estimates of Oil and Gas Resources for the Planning Area

	Gas (TCFG)	Oil (MMBO)	Natural Gas Liquids (MMBNGL)
Mean Undiscovered Volume ¹	3.13371	35.39	54.55
Estimated Range of Resources in the planning area ²	1.5389 – 5.49116	9.51 – 76.12	19.55 – 93.62
Source: BLM 2009c			
¹ Mean (average) undiscovered volume of all portions of assessment units lying within the planning area			
² Assuming fractile data used has a perfect positive correlation			
MMBNGL million barrels of natural gas liquids			
MMBO million barrels of oil			
TCFG trillion cubic feet of gas			

Projected Conventional Oil and Gas Drilling Activity in the Planning Area

For a baseline unconstrained reasonably foreseeable development projection (limiting factors such as lease stipulations, or the possibility that some areas might not be administratively available for leasing, are not considered at this stage of analysis), it is estimated that during the next planning cycle as many as 2,566 wells (not including CBNG) could be drilled in the planning area (Rocky Mountain Federal Leadership Forum 2002). Seventy-five of these wells could be deep wells (more than 15,000 feet deep).

Development potential is defined as high, moderate, low, very low, and none. It is estimated that average drilling densities per township (one township is approximately 36 square miles) during the planning period will be:

- High – 100 or more wells
- Moderate – 20 to 100 wells
- Low – 2 to fewer than 20 wells
- Very low – fewer than two wells
- None – no wells

Of the 2,566 projected wells, most (2,542) are projected in areas of high, moderate, or low potential (Map 17). Drilling activity will likely be concentrated in the following areas:

- High levels of activity will be in and around the Madden and Frenchie Draw fields on the northeastern portion of the planning area and in and around the Muddy Ridge field on the WRIR. Many new wells in these townships will likely be drilled as infill or fringe wells in existing fields, or as reentries into existing wellbores. Some minor exploratory activity could occur just beyond field boundaries. Well spacing is projected to be variable, in the 160- to 20-acre range.
- Moderate levels of activity will be in the northeastern part of the planning area, in and around the Sand Mesa field, in the Beaver Creek field area, and on the southern end of the planning area. Infill field drilling, fringe wells in existing fields, or wildcat wells to discover entirely new fields are all possible. As with areas of projected high density drilling, well spacing in

areas of moderate potential is likely to be variable, depending on the characteristics of the play(s) driving development.

- In areas of projected low potential activity, future drilling will be to either improve enhanced oil production projects; to add wells in and around existing oil and gas fields that are maturely developed and have limited opportunities to develop the existing reservoirs or additional deeper reservoirs; or to explore for new oil and gas reservoirs away from existing developed areas. Well densities will remain similar to what they are at present, with isolated townships having a low potential for an increase in drilling density.

Most of the anticipated activity in the planning area will be infill drilling to increase proven recoverable reserves and as exploratory drilling to further explore the potential of continuous resources identified by the USGS in the Wind River Basin and Southwestern Wyoming provinces (USGS 2002, USGS 2005a, USGS 2005b, USGS 2008). Initial estimates of the ultimate size of new oil or gas fields are usually too low, and over time, newer estimates of the size and ultimate recovery contribute to growth in the reserve estimate (Central Region Energy Resources Team 1996). Factors that could contribute to increases in reserve growth in the planning area include:

- Physical expansion of fields by areal extensions and development of new producing intervals
- Improved recovery resulting from application of new technology and engineering methods
- Upward revisions of reserve calculations based on production experience and changing relations between price and cost

Coalbed Natural Gas Production in the Planning Area

There is little CBNG activity in the planning area. Existing CBNG producing zones are coals in the Mesaverde Formation. Three areas in the planning area have produced CBNG, two on the southeastern fringe of the WRIR and one just 4 miles south of the WRIR boundary at the Beaver Creek field.

Three CBNG units have been designated in the southern portion of the planning area; however, at present, there are no producing CBNG wells in any of these units.

Table 3.22, “Cumulative Production (through October 2008) for Coalbed Natural Gas Wells within the Planning Area” (p. 346) lists cumulative production of CBNG and produced water from all active CBNG wells since the first producing well was completed in 1990. Cumulative CBNG production in the planning area has been more than 5.026 billion cubic feet and cumulative water production has been more than 13.7 million barrels.

Table 3.22. Cumulative Production (through October 2008) for Coalbed Natural Gas Wells within the Planning Area

Year	Cumulative Oil (barrels)	Cumulative Gas (thousand cubic feet)	Cumulative Water (barrels)	Days on Production	Active Wells
1990	0	4,397	5,590	28	1
1991	0	24,520	25,057	319	1
1992	0	15,590	20,982	246	1
-	-	-	-	-	-
1999	0	39	994	8	1
2000	0	5,403	1,610,607	712	4

Year	Cumulative Oil (barrels)	Cumulative Gas (thousand cubic feet)	Cumulative Water (barrels)	Days on Production	Active Wells
2001	0	8,238	1,674,494	727	4
-	-	-	-	-	-
2005	0	364,463	428,149	2,004	9 to 16
2006	1,026	846,601	2,159,245	5,687	15 to 19
2007	417	1,826,016	2,843,328	3,911	11
2008	255	1,930,903	4,965,604	4,385	10 to 11
Total	1,698	5,026,170	13,734,050	18,027	57 to 69

Source: BLM 2009c

Projected Coalbed Natural Gas Drilling Activity in the Planning Area

Development potential for CBNG ranges in the planning area between moderate, low, very low, and none. It is estimated that average drilling densities per township (one township is approximately 36 square miles) during the planning period will be:

- Moderate: 20 to 100 wells
- Low: two to fewer than 20 wells
- Very low: fewer than two wells
- None: no wells

For a baseline unconstrained reasonably foreseeable development projection for CBNG, the BLM estimates that during the next planning cycle, up to 861 CBNG wells could be drilled in the planning area (Rocky Mountain Federal Leadership Forum 2002). It is anticipated that approximately 844 of the new CBNG wells will be drilled somewhere in the areas of moderate or low potential and the remaining 17 wells will be drilled in the areas of very low potential (Table 3.23, “Estimated Coalbed Natural Gas Development Potential in the Planning Area between 2008 and 2027” (p. 347)) (Map 20). CBNG wells drilled through 2017 will likely be in areas of moderate potential where there is existing or proposed activity.

Table 3.23. Estimated Coalbed Natural Gas Development Potential in the Planning Area between 2008 and 2027

Development Potential	Area (total acres)	Number of Townships with Development Potential	Average New Wells per Township	Percent of Planning Area
High	0	0	110	0
Moderate	149,401	6.48	60	2.30
Low	1,309,236	56.82	8	20.18
Very Low	1,611,953	69.96	0.25	24.85
None	2,907,578	126.20	0	44.82
Not Assessed	508,759	22.08	0	7.84

Source: BLM 2009c

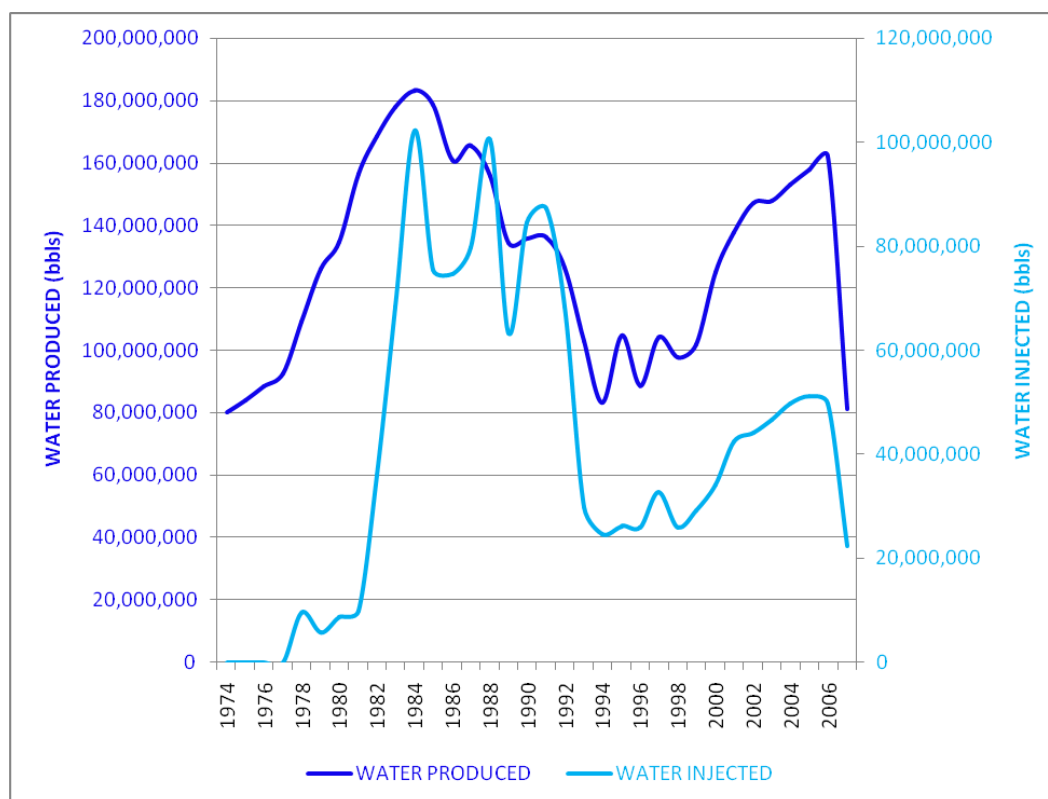
Produced Water

Water is often produced in conjunction with the production of oil and gas from most reservoirs. Water is injected into oil reservoirs as part of waterflooding projects or the water produced in conjunction with oil and gas production can be disposed of (injected) into the subsurface. Produced

water that is not injected is disposed of in evaporation ponds, and in a limited number of ponds, managed by the State of Wyoming under WYPDES. Waterflooding projects also cause an increase in associated water production. Figure 3.17, “Annual Water Injection and Water Production Rates in the Planning Area (includes the Wind River Indian Reservation)” (p. 348) shows volumes of annual water produced and annual water injection. Increases in water production in recent years are mainly tied to increased gas production (Figure 3.15, “Annual Oil and Gas Production Rates from Federal, Tribal, Private, and State Wells in the Planning Area” (p. 343)). Cumulative water produced through August 2007 was 4,389,859,424 barrels.

Water injection (mostly for waterflooding purposes) was highest from 1982 through 1992 and then dropped off for a number of years when oil prices were very low and there was little incentive to produce oil. Water injection began to increase again in 1999 and peaked in 2006, at more than 50 million barrels (BLM 2009c). With higher oil prices in recent years, there has been added incentive to bear the additional costs of waterflooding to obtain additional oil production. Since 1982, the water production curve has tended to mirror the water injection curve, but at higher rates.

Coproduction of water associated with oil and gas development is unavoidable at most locations. Wyoming allows water produced with oil and gas to be disposed of by injection in a permitted disposal or enhanced recovery well, evaporation in an approved pit, or discharge into a surface water source through an outfall permit. At present, the planning area has 26 active and two shut-in disposal wells (Wyoming Oil and Gas Conservation Commission 2008).



Source: BLM 2009c

bbls barrels

Figure 3.17. Annual Water Injection and Water Production Rates in the Planning Area (includes the Wind River Indian Reservation)

The geographic distribution of water quality samples in relation to TDS and salinity can be found in the *Reasonably Foreseeable Future Development Scenario for Oil and Gas* (BLM 2009c).

Management Challenges for Oil and Gas Development

A variety of management challenges for oil and gas exploration and development are associated with both public and internal BLM issues. Oil and gas exploration and development is a necessary, but sometimes contentious, activity with highly vested stakeholders. Oil and gas development in the planning area is associated with management challenges including impacts to resources and resource uses, produced water, mixed ownership patterns, and a variety of other issues.

Oil and gas development includes challenges for handling the disposal of produced water of variable quality, particularly TDS, while meeting management objectives for resources and resource uses. Management of produced water from oil and gas activities tends to be a disposal issue, not an impact on water quantity, because these wells do not produce from aquifers that meet the standards for U.S. drinking water.

The BLM also faces management challenges related to oil and gas development pressures and the need to conserve habitat for greater sage-grouse. In 2010, the U.S. Fish and Wildlife Service (USFWS) designated the greater sage-grouse as a candidate species for listing under provisions of the ESA (USFWS 2010). The BLM, in coordination with other federal and state agencies, local government, local working groups, and public land users, is implementing measures to conserve greater sage-grouse habitat and populations. Some areas with oil and gas development potential in the planning area lie within high-quality greater sage-grouse habitat; therefore, the BLM is challenged with how to manage such development while protecting greater sage-grouse habitat.

The viability of wildlife population levels is linked to a variety of factors, including habitat fragmentation. The BLM faces management challenges resulting from habitat fragmentation caused by oil and gas operations.

Oil and gas resources in the planning area might be located, in part, in areas with important visual resources, including ACECs, historic trails, and other scenic vistas. The BLM faces the challenge of managing oil and gas exploration and development while mitigating impacts to visual resources and meeting Visual Resource Management (VRM) objectives.

The land ownership pattern in the planning area consists of mixed ownership between BLM-administered lands, the WRIR, state trust lands, private lands, private surface overlying federal mineral estate, USFS lands, and lands managed by the Bureau of Reclamation. Management of oil and gas operations becomes more complex where projects are proposed in areas of mixed ownership.

Oil and gas activities, like other mineral development, fluctuate with price. The level of activity in “oil equivalents” such as natural gas increased with the international price of petroleum. As that price fell starting in the beginning of 2009, natural gas Applications for Permit to Drill (APDs) also fell. The high fluctuation in activities causes planning and staff issues for the BLM and impacts the local economy that depends on mineral activities.

Additional management challenges for oil and gas exploration and development for the BLM include:

- Processing timeframes for APDs and notices to conduct seismic exploration

- Timing restrictions on oil and gas leases, Notices of Intent to conduct geophysical exploration, and APDs
- Processing timeframes for ROW applications
- Road design requirements
- Lessee's/operator's surface use rights
- Impacts from oil and gas development and exploration activities on grazing lessees
- Impacts from oil and gas development and exploration activities on cultural resources
- Impacts from oil and gas development and exploration activities on air and water quality
- Impacts from oil and gas development and exploration activities on soils and vegetation
- Multiple-use conflicts resulting in restricted access to oil and gas resources
- Impacts from oil and gas development on levels of CO₂ in the atmosphere and on climate change
- Economic impacts on local, state, and federal government from oil and gas production in the planning area
- Split-estate issues
- Staffing and priority to complete oil and gas workload

3.2.5. Leasable Minerals – Oil Shale-Tar Sands

Oil shale-tar sands are an unconventional type of oil production (as distinguished from the recovery of oil and gas from shale formations). At present, there is no development of oil shale-tar sands in the planning area. There are low-quality oil shale deposits in the southern part of the planning area; however, there is little potential for commercial development of these resources. Based on these resource values, the existing Lander RMP was not amended for oil shale leasing under the PEIS for oil shale and tar sands resources (BLM 2008c).

3.2.6. Leasable Minerals – Other Solid Leasable Minerals

Other solid leasable minerals (non-coal) present within the planning area include phosphate and oil shale-tar sands (Ver Ploeg 1986). A very small segment of the Green River Formation in the South Pass portion of the Lander planning area contains oil shale-tar sand deposits. These remote locations are not deemed commercially viable (BLM 2008c). Lander is not part of the programmatic analysis of oil shale-tar sands resources currently being analyzed in the PEIS released for comment in 2012. Accordingly, no management decisions are required for oil shale-tar sands.

Rocks of the Permian System (299 to 251 million years ago) comprise one of the most complex and also most closely studied Paleozoic systems in the planning area. These strata are an important source of phosphate in the Intermountain West.

Studies over the years attempted to quantify the distribution and grade of phosphate-bearing sedimentary rocks in the Permian Phosphoria Formation in three general locations (BLM 2009a). The largest and most well known occurrence is on the northwest flank of the Wind River Range, particularly in the area known as the Lander Front or Lander Slope. The rock along the Lander Front can be traced south from the Dubois area to the Sweetwater River. The other occurrences of phosphate-bearing sedimentary rocks are Crooks Mountain, Lysite Mountain, and the Conant Creek Anticline southeast of Riverton (BLM 2009a).

A U.S. Bureau of Mines analysis (BLM 2009a) identified and ranked known mineral deposit areas, which are areas having past or present mineral production and/or known mineral resources. This effort mapped areas in relation to their favorability for phosphate. The classification of phosphate deposits is based on two factors: how well understood the physical extent of the deposit is (degree of geologic assurance) and how feasibly the deposit can be mined and marketed with existing technology and under current market conditions (feasibility of economic recovery). Table 3.24, “Percentage of Phosphate Lands in Moderate and High Favorability Classifications in the Planning Area” (p. 351) lists the percentage of phosphate lands in moderate and high favorability classifications in the planning area (Map 19). Crooks Mountain was not classified as having a favorability above low in this data set.

Table 3.24. Percentage of Phosphate Lands in Moderate and High Favorability Classifications in the Planning Area

Phosphate Field	Total Area (acres)	High Favorability (acres / percent)	Moderate Favorability (acres / percent)
Lander Front	400,556	3,702 (0.9%)	396,854 (99.1%)
Conant Creek	509	0	509 (100%)
Lysite Mountain	2,100	0	2,100 (100%)

Source: BLM 2009a

Other Solid Leasable Mineral Activity

Until very recently, there had been little interest in phosphate except for one proposal in which planning area phosphate deposits were seriously considered for development during the 1960s through 1980s. During this period, a mining company extensively surveyed, mapped, drilled, trenched, and sampled phosphate deposits. Eventually, eight federal leases totaling 12,628 acres were issued and held by this company until 1985 (BLM 2009a). Although the mining company performed exploration activities under prospecting permits before it was issued leases, the company never performed mining operations under the leases.

At present, there are no phosphate lands under lease in the planning area, but in 2008 two proposals were submitted for phosphate prospecting and leasing, neither of which the BLM will consider until this RMP revision is finalized and a ROD is issued. There are currently no tar sand leases in the planning area.

There has been increased interest in phosphate potential on the Lander Front, both on federal mineral estate and lands owned by the State of Wyoming and managed in trust. There have been proposals for state phosphate leases.

Management Challenges for Other Solid Leasable Minerals

Management challenges for other solid leasable minerals reflect management challenges for other minerals in relation to impacts to resources and resource uses (especially disturbance to greater sage-grouse and associated habitat) and challenges associated with mixed land ownership patterns.

There are additional management challenges for other solid minerals associated with the location of phosphate deposits in the planning area. Phosphate deposits in the planning area are located, in part, in areas with important visual resources including ACECs, NHTs, and other scenic vistas. There are phosphate deposits on the northwest flank of the Wind River Range in the area known as the Lander Front or Lander Slope, where scenic vistas are prominent on the landscape. The BLM faces the challenge of managing phosphate exploration and development while mitigating impacts to visual resources. Managing for other resource objectives in these specially designated areas in association with phosphate development could pose additional management challenges.

3.2.7. Salable Minerals

Salable minerals, also called mineral materials, known to be present in the planning area include sand and gravel (aggregates), common-variety (non-metallurgical-grade) limestone, granite, shale and moss rock (lichen stone). Sand and gravel are the most common type of mineral materials found in the planning area (Map 18). Sand and gravel are typically used for road base, oil and gas drill pads, and various building-construction projects. Most of the limestone in the planning area is considered common variety and therefore salable. Crushed limestone can be used for rip rap or for road base in place of sand and gravel. Granite and moss rock are used for building or decorative stone. Shale has been recently used for cap material in AML reclamation projects, due to its low permeability. Refer to the *Mineral Occurrence and Development Potential Final Report* (BLM 2009b) for additional information on salable minerals.

Sand and gravel are found on old terrace benches along former and existing major drainages and pediment surfaces adjacent to range fronts. Formations for the potential exploitation of limestone resources include the Alcova Limestone member of the Chugwater Group, and the Madison Limestone. Large quantities of granitic mineral material are available at various places in the planning area, most abundantly in the Sweetwater Rocks and the Granite Mountains area. Shale is commonly obtained from exposures of Cody Shale.

Statutory and Regulatory Authority

The Materials Act of 1947 authorizes the BLM (under rules and regulations prescribed by the Secretary of the Interior) to dispose of mineral and vegetative materials through a contract or a free-use permit. The Surface Resources Act of 1955 amended the Materials Act to make common varieties of sand, stone, gravel, pumice, pumicite, and cinders salable minerals. Applicable regulations are found at 43 CFR 3600.

The BLM may dispose of mineral materials by sale or on a free-use basis to units of government and non-profit organizations. If the BLM sells such materials, it does so at not less than fair market value (see FLPMA, Sec. 102[9] and 43 CFR 3601.6). It is BLM policy to make mineral materials available unless it is detrimental to do so (see 43 CFR 3601.6). However, mineral material disposals are discretionary. The BLM may deny an applicant's request based on various considerations such as an inadequate plan, or to protect other competing resources (e.g., wildlife, scenic values, grazing, and sensitive soils) identified through National Environmental Policy Act (NEPA) analysis.

Mineral materials may also be acquired from BLM-administered lands by the State of Wyoming Department of Transportation for development of federal-aid highways, under a Title 23 Material Site ROW realty action. The authority for Title 23 actions is an Interagency Agreement between the BLM and the Federal Highway Administration AA-851-IA2-40, dated July 1982. In Wyoming, this is implemented under Memorandum of Understanding (MOU) WY920-08-07-192, among the BLM, Wyoming Department of Transportation, and the Federal Highway Administration, signed August 24, 2007.

There are two broad categories of mineral material disposals: exclusive disposals and non-exclusive disposals. Under exclusive disposals, the purchaser has an exclusive right to the materials and sole responsibility for developing and reclaiming the site or a designated portion of the site. There are three types of exclusive disposals: negotiated sales, competitive sales, and free use permits. Non-exclusive disposals are made from sites to which the general public has access and more than one party has a right to remove materials. There are two types of nonexclusive disposal sites: the community pit and the common use area (CUA). The distinction between the two is that community pits are limited areas with extensive disturbance requiring reclamation, while CUAs are generally broader geographic areas which, after removal of the minerals, require little or no reclamation. The BLM may impose a reclamation fee on the user to cover the BLM's costs to reclaim the disturbance.

Due to its demand as a decorative building stone, several CUAs have been established for moss rock collection in the planning area. Only two CUAs, Little Popo Agie CUA and Diamond Springs CUA, remain active but are near depletion of readily available moss rock.

For exclusive disposals, the BLM is commonly approached by a private or public entity (e.g., local government agency) with a specific plan to obtain mineral materials from a certain location. The BLM must then process the request under the NEPA process and develop any necessary stipulations and mitigations required to protect other resources affected by the disposal. Typically, environmental assessments are performed for each proposal. When a contract for mineral materials amounts to less than 50,000 cubic yards or the disturbance covers an area of less than 5 acres, a categorical exclusion is commonly granted.

Once a determination is made to process a mineral material disposal, a contract is issued to describe the location of the disposal, the quantity of material authorized to be removed, and the total cost of the material. Contracts also include the terms of use (such as seasonal restrictions and access), and the required bond for reclamation. The terms of payment depend on the total cost of the material. If the cost is under \$2,000, the total amount is due in full when the contract is issued. Cost of the material is determined by the most up-to-date appraisal schedule furnished by the BLM.

Non-exclusive disposals are usually accomplished "over the counter" at the field office. A customer seeking mineral materials will identify what type of material is desired and will then be directed to one of several areas developed for that purpose. The customer must sign a contract and pay in advance for the desired quantity of material. The cost of the material is determined by the most up-to-date appraisal schedule.

Mineral Materials Activity

The amount of mineral material disposals generally reflects economic conditions. Because the main uses of mineral materials are associated with construction work and oil field development, these activities highly reflect mineral material use and disposal. The increase in oil and gas

activity from approximately late 2004 until the third quarter of 2008 resulted in a period of increased use of mineral materials in the planning area. Planning area infrastructure has remained static during the last planning cycle, and due to this, free use permits and material sales have decreased compared to earlier periods. In addition, most of the large AML projects in the Gas Hills and Crooks Gap Districts have been completed as of the mid-2000s; these were large contributors to disposal activity.

Aggregate disposals track the economy and AML work. Disposals experienced a higher rate during the late 1980s until mid-2000s due to the large amount of AML work. Also, demand increased due to increased oil field development in the mid-to-late 2000s. Development dropped off substantially beginning in fall of 2008.

In the late 1980s, more than 500,000 cubic yards of limestone were sold in the Gas Hills for the purpose of AML work at former uranium mining properties. This material was taken from the Dutton Anticline where the Alcova Limestone is exposed at land surface. The permit expired in 2000, and there has since been no substantial use of these resources.

Large quantities of granite (up to 100,000 cubic yards) were sold from the so-called Black Rock quarry approximately 9 miles north of Jeffrey City over the last decade or so for the purpose of completing various AML-related projects. There has been no substantial use of these resources since.

Approximately 1.5 million cubic yards of shale were removed from shale pits near the Gas Hills and more than 1 million cubic yards were removed from another pit south of Jeffrey City, both utilizing this material for AML reclamation activities during approximately the last decade. There has since been no substantial use of these resources.

Moss rock disposal in the planning area has declined possibly due to two factors. Two CUAs were substantially utilized and availability of substantial quantities of high-quality moss rock in these locations is limited. The public-at-large is less willing to obtain moss rock through individual negotiated sales due to higher costs associated with cost recovery policy and delays associated with NEPA analyses.

Sand and gravel are the only mineral materials commonly authorized for disposal under free use permits in the planning area (Table 3.25, "Authorized Mineral Material Free Use Permits in the Planning Area" (p. 355)). Sand and gravel and soil/fill materials are the only pending mineral material free-use permits in the planning area (Table 3.26, "Pending Mineral Material Free Use Permits in the Planning Area" (p. 355)).

Table 3.25. Authorized Mineral Material Free Use Permits in the Planning Area

Entity	Name or location	Case Number	Commodity	Amount
Wyoming Game and Fish Department	Bear Creek Pit, East Fork Wind River	WYW152033	Sand and gravel	3,000 CY
Fremont County Road Department	Jeffrey City Pit	WYW154885	Sand and gravel	130,000 CY
Town of Dubois	Overlook site	WYW159799	Sand and gravel	10,000 CY
Fremont County Road Department	Moneta-Lysite Hwy Project	WYW149779	Sand and gravel	40,000 CY
Fremont County Road Department	Lost Cabin Pit	WYW152039	Sand and gravel	200,000 CY
Wyoming DEQ AML	Gas Hills haul road restoration project	WYW158055	Sand and gravel	20,000 CY
Source: BLM 2009b				
AML Abandoned Mine Land				
CY cubic yard				
DEQ Department of Environmental Quality				

Table 3.26. Pending Mineral Material Free Use Permits in the Planning Area

Entity	Name or location	Case Number	Commodity	Quantity
Fremont County Road Department	Sec. 23, T. 37 N., R. 94 W. (Muskrat Crossing)	WYW135187	sand and gravel	10,000 CY
Fremont County Road Department	Sec. 6, T. 36 N., R. 93 W. (Muskrat Pit)	WYW135188	sand and gravel	15,000 CY
Fremont County Road Department	Sec. 27, T. 30 N., R. 95 W. (Sweetwater Station)	WYW147151	sand and gravel	8,072 CY
Fremont County Road Department	Sec. 1, 12, T. 38 N., R. 91 W. (Lysite Gravel Pit)	WYW147157	sand and gravel	20,000 CY
Fremont County Road Department	Sec. 30, T. 39 N., R. 90 W. (Badwater Borrow)	WYW159824	sand and gravel	5000 CY
Wyoming Department of Transportation	Sec. 26, T. 35 N., R. 94 W.	WYW152035	soil/fill	10,000 CY
Wyoming Department of Transportation	Sec. 9, T. 34 N., R. 92 W.	WYW152036	soil/fill	10,000 CY
Wyoming Department of Transportation	Sec. 32, T. 35 N., R. 93 W.	WYW152037	soil/fill	10,000 CY
Wyoming Department of Transportation	Sec. 31, 32, T. 35 N., R. 92W.	WYW152038	soil/fill	10,000 CY
Source: BLM 2009b				
CY cubic yard				
N North				
R Range				
Sec. Section				
T Township				
W West				

The planning area currently has authorized sales of mineral materials for sand and gravel, decorative stone and moss rock. The planning area has pending sales of mineral materials for sand

and gravel, shale, limestone, moss rock, and decorative stone (Table 3.27, “Current and Pending Authorized Sales of Mineral Materials” (p. 356)).

Table 3.27. Current and Pending Authorized Sales of Mineral Materials

Status	Commodity	Quantity
Current	Sand and gravel	50,000 cubic yards
Current	Decorative stone	100 tons
Current	Moss rock	10 tons
Pending	Sand and gravel	18,000 cubic yards + undetermined amount
Pending	Shale	100,000 tons
Pending	Limestone	Undetermined amount
Pending	Moss rock	650 tons
Pending	Decorative stone	15 tons

Source: BLM 2009b

Management Challenges for Salable Mineral Development

Management challenges associated with disposal of mineral materials result from adverse impacts to resources and resource uses from mining activities and the demand for mineral materials. The need to conserve greater sage-grouse habitat can conflict with the development of mineral material resources. Some salable mineral resources in the planning area might lie in or near habitat for the greater sage-grouse. Although salable mineral disposals are discretionary, the BLM faces challenges in meeting demands for these minerals while protecting greater sage-grouse habitat.

Areas of mixed land ownership pose additional management challenges for mineral material disposal. Management of salable mineral operations becomes more complex where projects are proposed in areas of mixed ownership. In particular, salable mineral operations on land surface patented under the Stock Raising Homestead Act can present management challenges related to coordinating the concerns of the surface owner with the mineral operations. The 1983 *Watt v. Western Nuclear* U.S. Supreme Court decision, which established that gravel on Stock Raising Homestead Act lands belonged to the federal government, was a case originating in the planning area near Jeffrey City.

Due to the relatively high cost of transportation to the site of end use compared to value in place, salable minerals tend to serve local markets. These minerals help meet the demand for community growth. The BLM faces management challenges in meeting the demand for mineral materials to meet local needs while mitigating potential impacts to other resource values.

3.3. Fire and Fuels Management

Fire is an integral part of the ecological process of many plant communities in the planning area. Several vegetation types in the planning area have developed under a regime of intermittent fires and have adapted to the impacts of fires in some way. For each vegetation type, fire behavior varies based on many factors, including topography and site productivity. Highly productive sites, such as north slopes, generally have more biomass and therefore can carry fires better than less productive sites characterized by less fuel.

Within the western sagebrush steppe ecosystem, natural and human-caused fire played an important role at the landscape level in creating a mosaic of early, mid, and late seral sagebrush steppe in the varied habitat types (Paysen et al. 2000). It is important to not overlook the

prehistoric and early historic human use of fire, possibly to modify habitat types for hunting purposes (Arno 1983, Barrett and Arno 1982).

The 2001 Review and Update of the 1995 Federal Wildland Fire Management Policy is the primary interagency wildland fire policy document. In February 2009, a joint effort between the BLM, USFS, Bureau of Indian Affairs, USFWS, and the NPS resulted in updated guidance for implementation of the Federal Wildland Fire Management Policy (DOI and USDA 2009). This guidance provides for consistent federal implementation of the Federal Wildland Fire Management Policy.

According to the implementation guidance for the fire policy the following terms are used to describe the different types of fire:

- Prescribed fire – Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.
- Wildland fire – A general term describing any non-structure fire that occurs in the vegetation and/or natural fuels.
- Wildfire – An unplanned ignition caused by lightning, volcanoes, unauthorized, and accidental human-caused actions and escaped prescribed fires.

The BLM fire management program focuses on two categories of fires: unplanned/wildfires and planned/prescribed fires. The objectives of prescribed fires include reduction of fuels, maintenance or improvement of wildlife habitat or range conditions, control of invasive species, and maintenance of the historic fire return interval. Firefighter and public safety are the highest priority in every fire management activity.

For much of the last century throughout the United States, fire management has focused on the suppression of wildfires with minimal use of prescribed fires to achieve management objectives. As a result, there has been a buildup of vegetative fuels and biomass, exacerbated by the impacts of disease and drought.

Both wildfires and prescribed fires could be utilized as management tools to achieve predetermined objectives established through the land use planning process. The fire management program utilizes a full suite of fire suppression tactics in containing and controlling wildfires throughout the planning area, with the highest likelihood for use of full suppression tactics occurring in areas with high resource and/or human values and in areas with intermingled land ownership patterns, while also utilizing prescribed fire and other fuel treatments to help meet the objectives of other resource management programs.

The BLM response to wildland fires is based on values to be protected from and/or enhanced by wildland fires. The response to wildland fires also considers the ecological, social, and legal consequences of fires. The circumstances under which a fire occurs, and the likely consequences to firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire. The response to wildland fires considers all resource values and concerns and is coordinated across jurisdictional boundaries. Although fire terminology changes over time, the approach to suppression actions remains relatively consistent.

The Wind River Bighorn Basin District has interagency cooperative agreements with the Shoshone National Forest, WRIR, Wyoming State Forestry, Fremont County Rural Fire

Associations, Hot Springs County, Natrona County, Sweetwater County, Carbon County, city of Riverton, city of Lander, all local fire battalions, local volunteers, and all Firewise communities. Fire suppression operations are coordinated with the **Cody** Interagency Dispatch Center.

3.3.1. Unplanned/Wildfire

Wildfires are unplanned ignitions caused by natural events (e.g., lightning) or by human acts. There have been numerous large fires in the planning area from 1988 to 2008 at a scale and quantity that exceeds the annual average acreage burned in the previous 13-year period from 1974–1987. (Table 3.28, “Selected Large Wildfire Occurrences in the Planning Area, 1988-2008” (p. 358)). Whether this trend is part of the natural fire cycle or representative of flammable conditions because of past fire and vegetation management is not precisely understood. Regardless, it appears that the planning area is within an undetermined period of more frequent, larger fire occurrence. Much of the forest, shrublands, and grasslands are vulnerable to wildfires, but under existing conditions the areas that have the greatest potential for large wildfires are within the 15- to 19-inch and 20-inch precipitation zones where natural fuel loading is greater (Map 44). Almost all of the fires larger than 100 acres within the planning area have been within these precipitation zones. Figure 3.18, “Acres Burned and Number of Wildfires per Year within the Lander Field Office, 1974-2008” (p. 360) depicts the number of wildfires and the number of acres burned by wildfires each year from 1974 to 2008.

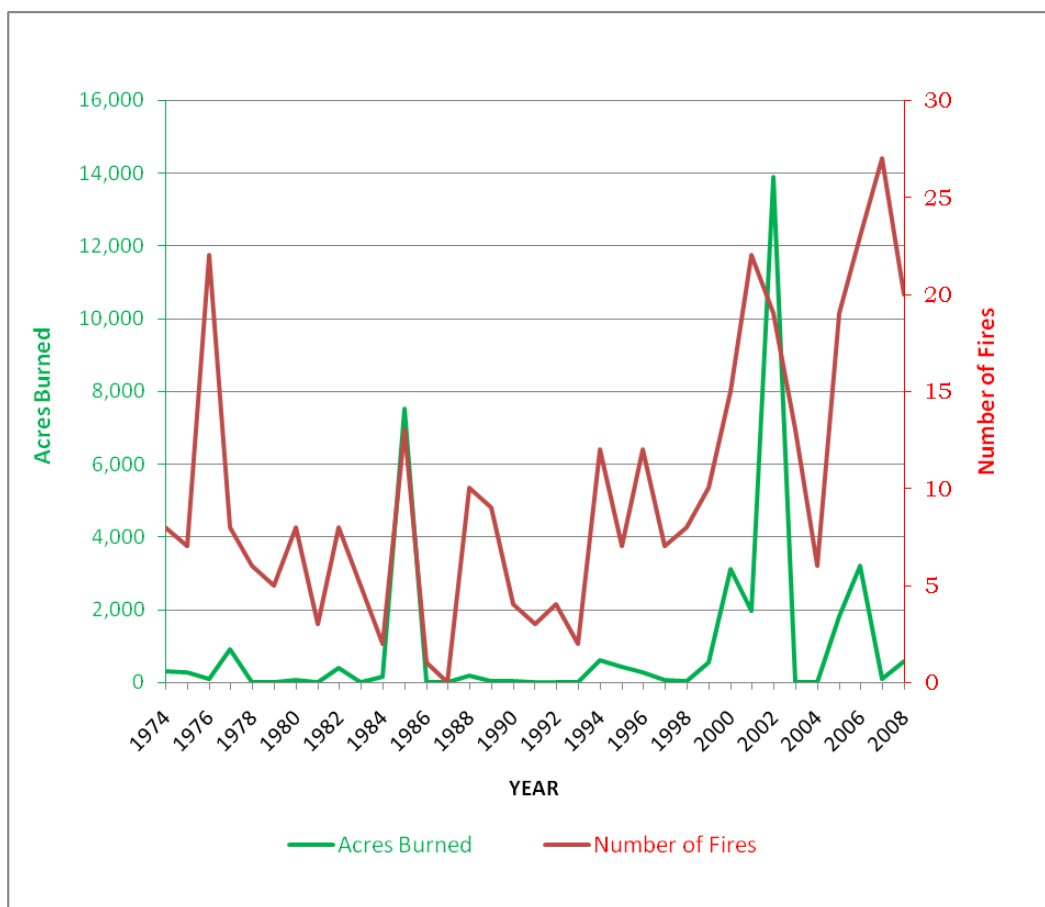
The nature of historical fire patterns in sagebrush communities, particularly in *Artemisia tridentata wyomingensis*, is not well understood, and there was likely a high degree of variability (Zouhar et al. 2008, Baker 2006). Depending on the species of sagebrush and other site-specific characteristics, fire return intervals from 10 to well over 300 years have been reported (Zouhar et al. 2008). In general, fire extensively reduces sagebrush and some varieties, such as *Artemisia tridentata wyomingensis*, can take up to 150 years to reestablish in an area (Braun 1998, Baker 2006).

Table 3.28. Selected Large Wildfire Occurrences in the Planning Area, 1988-2008

Name	Year	Jurisdiction	Cause	Acres	Precipitation Zone (inches)	Fuel Type
North Fork	1988	BIA	Lightning	25,000 (approximate)	10-14 and 15-19	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine
Kates Basin	2000	BIA	Lightning	137,069	10-14, 15-19, and 20+	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine, lodgepole pine

Name	Year	Jurisdiction	Cause	Acres	Precipitation Zone (inches)	Fuel Type
Murphy Draw	2000	BLM	Human Caused	1,365	15-19	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine
Red Canyon	2000	BLM	Lightning	1,312	15-19	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine
Bighorn Flat Unit 3	2000	BIA	Escaped Prescribed Fire	751	10-14	Wyoming sagebrush/ grass
Beaver Rim	2001	BLM	Lightning	1,927	15-19	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine
Bighorn Flat Unit 1	2001	BIA	Escaped Prescribed Fire	655	10-14	Wyoming sagebrush/ grass
Pass Creek	2002	BLM and USFS	Lightning	13,433	15-19 and 20+	Wyoming Sagebrush/ grass, mountain shrub/grass, juniper/limber pine, lodgepole pine
South Fork 2	2002	BIA	Lightning	13,978	15-19 and 20+	Wyoming sagebrush/ grass, mountain shrub/grass, lodgepole pine
Sagehen	2005	BLM	Lightning	1,271	15-19	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine
Wise Flat	2006	BIA	Lightning	1,044	15-19	grass, juniper/ limber pine
Bull Ridge	2006	BIA	Lightning	837	15-19	grass, juniper/ limber pine

Name	Year	Jurisdiction	Cause	Acres	Precipitation Zone (inches)	Fuel Type
Washakie Park	2006	BIA	Lightning	1,240	15-19	Wyoming sagebrush/ grass, mountain shrub/grass
Poison Spider	2006	BLM	Lightning	3,166	15-19	Wyoming sagebrush/ grass, mountain shrub/grass, juniper/limber pine
Total Acres				203,048		
Source: BLM 2009a						
BIA Bureau of Indian Affairs						
BLM Bureau of Land Management						
USFS United States Forest Service						



Source: BLM 2010a

Figure 3.18. Acres Burned and Number of Wildfires per Year within the Lander Field Office, 1974-2008

Public Safety and Resource Protection

Title 1 of the Healthy Forest Restoration Act requires identification and mapping of the fire regimes and Fire Regime Condition Classes (FRCCs) on BLM-administered lands at risk of wildfire and insect or disease epidemics. BLM policy requires that existing and desired resource conditions related to fire management be described in terms of three condition classes and five fire regimes. The FRCC system classifies existing ecosystem conditions to determine priority areas for treatment. This system provides a measure of the existing vegetation community's degree of departure from a reference condition. Departure from the reference condition can indicate changes to key ecosystem components such as vegetation characteristics; fuel composition; fire frequency, severity and pattern; and other associated disturbances, such as insect- or disease-related mortality. FRCC involves two pieces of information: the historic fire regime and the condition class. Fire regime is the inferred historic fire return interval and severity on a given landscape (Table 3.29, "Fire Regime Groups and Descriptions" (p. 361)), while condition class is the departure of the given area from the historic fire interval.

Fire regime is an indicator of the role wildfires play in an ecosystem. A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the possible influence of intentional aboriginal fire use (National Wildfire Coordinating Group 2003). The BLM utilizes five historic fire regimes based on the average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation.

Table 3.29. Fire Regime Groups and Descriptions

Group	Frequency	Severity	Severity Description
I	0 to 35 years	Low/mixed	Generally low-severity fires replacing less than 75 percent of the dominant overstory vegetation; could include mixed-severity fires that replace up to 75 percent of the overstory.
II	0 to 35 years	Replacement	High-severity fires replacing more than 75 percent of the dominant overstory vegetation.
III	35 to 200 years	Mixed/low	Generally mixed-severity; could also include low-severity fires.
IV	35 to 200 years	Replacement	High-severity fires.
V	More than 200 years	Replacement/any severity	Generally replacement-severity; could include any severity type in this frequency range.

Source: DOI and The Nature Conservancy 2008

Historically, wildfires in the planning area have generally been group III or IV, meaning that wildfires occurred every 35 to 200 years. The amount of overstory replacement was highly variable.

FRCC describes the degree of departure from the historic natural fire regime in terms of either fire frequency or stand replacement (Hann and Bunnell 2001). Extreme departure from the historic fire regimes results in changes to one or more of the following ecological components: vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic

pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances such as livestock grazing and drought. The majority of the planning area is composed of FRCC 2 and 3 (Map 42). FRCC describes ecosystem health, as follows:

- **Condition Class 1.** For the most part, fire regimes in this fire condition class are within historical ranges. Vegetation composition and structure are intact. Therefore, the risk of losing key ecosystem components from the occurrence of fire remains relatively low.
- **Condition Class 2.** Fire regimes on these lands have been moderately altered from their historical range by either increased or decreased fire frequency. A moderate risk of losing key ecosystem components has been identified on these lands.
- **Condition Class 3.** Fire regimes on these lands have been substantially altered from their historical return interval. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical ranges by multiple return intervals. Vegetation composition, structure, and diversity have been substantially altered. Consequently, these lands verge on the greatest risk of ecological collapse.

The planning area is divided into six Fire Management Units (FMUs) (Table 3.30, “FRCC Ratings and Management Prescriptions by Fire Management Unit” (p. 363)) (Map 43). An FMU is a geographic area with similar plant communities and resource and fire management objectives. The fire program identifies a full suite of responses to all wildland fires, with responses ranging from monitor to full suppression. The response to wildland fires also includes managing a wildland fire for multiple objectives, including, but not limited to, firefighter safety and resource benefit. The BLM tailors responses to wildland fires to meet management objectives. In establishing a response to wildland fires, the BLM considers the impacts of both fire suppression and unsuppressed fire on wildlife, viewshed, invasive species, and loss of forest products, particularly when cumulative impacts are considered. Appendix O (p. 1605) lists the suppression objectives, fire use and prescribed burn objectives, planned fuels treatment by vegetative type, non-fire fuel treatment objectives, community protection and assistance, prescribed fire and non-fire treatments, and restoration and rehabilitation objectives by FMU.

The Wyoming BLM Forest and Woodland Management Action Plan concluded that the information regarding condition class within forest and woodland communities was based on the foresters’ professional opinions in the absence of up-to-date inventory data (BLM 2005c). Moreover, these criteria were not the same as the FRCC definitions. In the future, the goal is to complete a vegetation fuels inventory that more accurately identifies fire regimes and condition classes across the landscape using up-to-date definitions and determination methods as identified in the *Interagency FRCC Guidebook* (DOI and The Nature Conservancy 2008).

The locations of human-caused fires have been widespread in the planning area, with heavier concentrations of ignitions in the Green Mountain, Lander Slope, and Sweetwater Valley FMUs. Historically, wildfires have occurred in camping and woodcutting areas from accidental ignition caused by fireworks, campfires, and machinery. Wildfires not caused by humans have been widespread, with natural fires occurring in areas of intense lightning activity in the Lander Slope and Rattlesnake Hills FMUs. Table 3.30, “FRCC Ratings and Management Prescriptions by Fire Management Unit” (p. 363) lists information regarding condition and class for the six FMUs in the planning area.

Table 3.30. FRCC Ratings and Management Prescriptions by Fire Management Unit

Fire Management Unit	Total Acres (BLM-administered surface acres)	Fire Regime Group	Fire Regime Condition Class	Treatments
Green/Crooks Mountain	262,485 (220,114) WUI present	IV – lodgepole pine, limber pine, juniper, mountain shrub, big shrub	2-3 – timbered communities and 2 – shrubland communities	Prescribed fire and non-fire treatments (mechanical, chemical, biological) ongoing
Sweetwater Valley	2,267, 001 (1,745,060) WUI present	IV – big sagebrush V – juniper, limber pine, aspen	2	Prescribed fire and non-fire treatments (mechanical, chemical, biological) ongoing
Rattlesnake Hills	191,576 (128,729) WUI present	IV – big sagebrush V – juniper, limber pine, aspen	2	Treatment allowed, but not ongoing
Lander Slope	269,997 (128,675) Substantial WUI issues	IV – mountain shrub, limber pine, lodgepole pine, Douglas-fir	2	Prescribed fire treatments ongoing and planned
Copper Mountain	194,390 (127,153) WUI present	IV – big sagebrush V – juniper, limber pine	2	Prescribed fire and non-fire treatments (mechanical, chemical, biological) ongoing
Dubois (USFS has initial suppression management)	161,232 (42,736) WUI present	IV – mountain shrub, limber pine V – lodgepole pine, Douglas-fir	2 1 – the badlands	Prescribed fire and non-fire treatments (mechanical, chemical, biological) ongoing
Sources: BLM 2004b; National Fire Plan 2009				
BLM Bureau of Land Management FRCC Fire Regime Condition Class USFS United States Forest Service WUI Wildland-Urban Interface				

Fuel Loading

Table 3.30, “FRCC Ratings and Management Prescriptions by Fire Management Unit” (p. 363) provides a coarse scale landscape level assessment of condition class of the Lander Field Office FMUs based on University of Wyoming GAP Analysis Program Data (University of Wyoming 1994), ground truthing, and inputs from experts. There is no other inventory available to determine vegetation ecological condition and fuels build up. For example, the mountain pine beetle epidemic is present in the Dubois FMU, but the extent of the beetle epidemic is only loosely identified in the Lander Slope, South Pass, and Green Mountain FMUs.

In forested areas, mountain pine beetle outbreaks create a buildup of dead and dry fuels that are particularly susceptible to fire. Fuel loading caused by the pine beetle create a problem that traditional forest management practices are not designed to address. In the absence of a local market for beetle kill timber and lack of available funding to remove or treat beetle kill areas, fuel loading increases the potential for wildfire spread and occurrence.

The growing wildland-urban interface (WUI) brings more people in closer contact with forests and woodlands, making the public more invested as stakeholders and more concerned about the health and appearance of forests. Many treatments are designed to reduce the risk of landscape-level fire while maintaining the aesthetic qualities of the landscape. For example, juniper woodlands adjacent to the Red Canyon Subdivision were thinned to approximately 30-foot spacing, with a residual woodland stand representing a diversity of age classes. The finished treatment has maintained the qualities of juniper woodlands that landowners value, while reducing fuel loading.

The WUI could become more of an influence on fire suppression and fuel management activities in the future. Urban development and use of public land could increase as the population grows and the desire to live close to wildlands remains desirable. The fire and fuels treatment program is affected by the cost of suppressing wildfires, which has increased, particularly in the WUI. The WUI is a key aspect of fire and fuels management. Table 3.31, “Wildland Urban Interface Treatment Areas in the Planning Area” (p. 364) lists WUI areas that have been treated for fuels reduction.

Table 3.31. Wildland Urban Interface Treatment Areas in the Planning Area

Name	Adjacent Lands Jurisdiction	Fuels Reduction Treatment Type	Fuels Reduction Project Time	Natural Fuels Type
Union Pass	BLM and USFS	Forest fuels mechanical	10 years	Lodgepole pine
Red Canyon Subdivision	BLM	Woodland and sagebrush mechanical	5 years	Juniper/limber pine and sagebrush
Dubois Area	BLM, USFS, and state lands	Forest fuels mechanical	15 years	Lodgepole pine and mountain shrub
South Pass Atlantic City	BLM and USFS	Forest fuels, woodland, and sagebrush mechanical	15 years	Lodgepole pine, mountain shrub, Wyoming sagebrush
Homestead Park	BLM and USFS	Forest fuels, woodland, and sagebrush mechanical and prescribed fire	10 years	Lodgepole pine and mountain shrub
Source: BLM 2009a				
BLM Bureau of Land Management				
USFS United States Forest Service				
WUI Wildland-Urban Interface				

Management Challenges for Unplanned/Wildfires

Over the last century, the focus on suppressing wildfires has created a management challenge because fuels have built up and created the potential for larger wildfires. Likewise, the impacts of disease (pine beetle and other infestations) and recent drought have created similar management challenges. Fire and fuels management challenges have increased due to limited vegetation treatments that reduce fuel loading, such as vegetative thinning and forest product sales.

Encroaching development and urbanization create challenges for managing wildfires in WUI areas because the BLM needs to consider the potential impacts of fuels treatments and suppression tactics to certain adjacent areas that still contain a natural aesthetic. As the WUI increases with expanding development, the cost and personnel required to manage wildfires in these areas creates additional management challenges.

3.3.2. Planned/Prescribed Fires and Other Fuels Treatments

Prescribed fires and other methods of fuels reduction including mechanical, hand cutting and chemical treatments, have become increasingly important as tools to manage natural fuels buildup and to achieve habitat and rangeland health management objectives. There are many factors that affect the success of prescribed fire and other vegetation treatment methods. With the use of prescribed fire, these include fire behavior and characteristics including fire size, fire intensity, fire severity and weather conditions, as well as vegetation community condition prior to burning and the short-term and long-term management of a treatment area. Prescribed fires can also become uncontrolled due to a number of factors, including unanticipated weather changes. The success of non-fire fuels treatments is similar in that it is dependent upon short-term and long-term management of the project area post-treatment, the condition of the vegetation community prior to treatment, and the appropriate treatment location and extent to strategically reduce fuel loading in the event of a wildfire.

The goal of all fuels reduction and vegetation management treatments is to reduce the accumulation of hazardous fuel, diversify vegetation age class structures, or rejuvenate areas where woody vegetation has become decadent. For example, various areas of sagebrush and mountain shrub habitat in the Mexican Creek drainage were successfully prescribed burned between 2002 and 2005, rejuvenating wildlife habitat and reducing conifer encroachment. A similar prescribed burn project is being implemented near Lysite Mountain. Examples of mechanical treatments that have been implemented within the last several years include the reduction of timber fuels loading in the Dubois area from 2003 through the present time, mastication of juniper in the Lander area from 2005 through 2010, and mowing of sagebrush in the Sweetwater Valley FMU from 2005 through 2010.

Prescribed fire can be used to open the timber canopy so that more grasses and forbs are available and areas are open to wildlife use. Fire also can provide a mechanism for controlling plant diseases and insect infestations. Succession processes, such as aspen gradually succeeding to lodgepole pine and other conifers in the absence of fire, could be influenced by fire management. However, landscape scale changes such as is now being experienced because of the pine beetle infestation are likely to be considerable contributors to aspen succession. The success of fire as a management tool is a function of precipitation timing and amounts following the fire as well as post-fire vegetation management including livestock grazing.

The locations of prescribed fires are primarily selected so that fire improves rangeland health and wildlife habitat as well as targeting areas of hazardous fuel loadings. Project area boundaries are established to enable appropriate containment and control of the prescribed fire.

There are locations and fuels situations that are not appropriate for fire treatment, such as areas with high potential for erosion or invasive plant infestation or areas where fire would adversely impact visual resources. Subsequent chemical treatment could reduce the adverse impacts of invasive species following the otherwise beneficial fire treatment. In locations with Wyoming big sagebrush, the use of prescribed fires must be considered carefully. Wyoming sagebrush ecological sites in the planning area are in Fire Regime Group III, with the return to mature sagebrush dominated sites not occurring for at least 35 years after burning, but more likely not occurring for closer to 100 years. The FMU analysis needs to consider both beneficial and potentially adverse impacts from prescribed fires and wildlife habitat requirements (Davies et al. 2008, Davies et al. 2009a).

From 1985 to 2008, prescribed fires were used to treat 6,162 acres (BLM 2009a). Results included improved herbaceous production, rejuvenated crown sprouting, and robust seed production among shrub species such as true mountain mahogany, antelope bitterbrush, snowberry, and mountain sagebrush. In a few cases, portions of the treated areas were revegetated by invasive species such as cheatgrass, with a corresponding adverse impact to wildlife habitat and overall ecological health.

Vegetation treatment is addressed on a case-by-case basis because fire, mechanical, hand-cutting, and chemical treatments might not be appropriate for conditions on the ground. For example, studies indicate that burning of certain sagebrush steppe communities should be undertaken with caution because of the threat of invasive plant species and the importance of intact sagebrush steppe to many sagebrush-obligate wildlife species. Though non-fire fuels management methods can be viewed as “safer” treatment options on the landscape, many of the same issues exist for these options, such as threats of increasing the percent composition of invasive plant species within treated areas as well as conflicts with other resource disciplines whose goals may include maintaining current habitat conditions.

Large-scale prescribed burn, mechanical, and chemical fuels project areas are being identified, but to successfully achieve these landscape-level projects, planning at the allotment level needs to include fuels treatments where vegetation types are appropriate for the use of fire or other fuels treatment options and, in the case of prescribed fire, often include a post-fire change in livestock grazing management as described in Wyoming IM No. WY-2005-018.

Cheatgrass is a substantial component in many areas in the Sweetwater Valley, Lander Slope, and Copper Mountain FMUs, and it responds favorably to the reduction of shrub canopy from burning, mechanical and chemical treatment methods, negating the beneficial impacts of fuels treatment on the vegetative community (Zouhar et al. 2008, Blumenthal et al. 2006). There are several areas in these FMUs that would benefit from prescribed burning, mechanical treatment such as sagebrush mowing, and thinning of sagebrush with tebuthiuron, but these treatment methods would not be utilized due to the expected spread of cheatgrass unless followed by application of herbicides.

The Lander Field Office has identified prescribed fire/non-fire treatment objectives, planned fuels treatment by vegetative type, and non-fire fuel treatment objectives. At present, prescribed burning is a tool identified for each of the five FMUs that fall under the administration of the Lander Field Office. There are approximately 44,000 acres identified as suitable for treatment in the next 10 years either by prescribed burning and/or by mechanical, manual, chemical, or biological methods. Areas that are of primary interest for the use of prescribed fire are:

- Vegetation communities within the 15- to 19-inch precipitation zones, especially large-scale prescribed fire treatments in the Rattlesnake Hills and Green Mountain FMUs and smaller prescribed burn treatments in the Dubois, Lander Slope, Sweetwater Valley, and Copper Mountain FMUs (Map 43).
- Areas that have shown a beneficial response from such treatments are those dominated by mountain shrub/grass and juniper/limber pine woodlands.
- Areas that are identified within Condition Class 2 or 3 and Fire Regime Group IV.

All fuels management treatment options can also be used as tools to counter the damage from climate change by removing decadent vegetation and rejuvenating the carbon sequestration potential of vegetation. Fuels reduction is even more important as the climate warms and results in fluctuating precipitation patterns. Refer to the *Climate Change* section at the end of this chapter for more information regarding climate change.

Management Challenges for Planned/Prescribed Fires and Other Fuels Treatments

Management challenges for prescribed fire include the successful collaboration with adjacent landowners and stakeholders in conducting prescribed fires. The success of fire treatments depends on collaboration with affected stakeholders, including adjoining landowners or livestock permittees, surrounding municipalities, and regulatory agencies that monitor air quality. Planned and prescribed fires are usually successful only if BLM partners and cooperators agree with the approach. Another substantial challenge to implementing prescribed burns is conflicts with objectives from other resource disciplines within the BLM and other resource management agencies. For example, wildlife habitat management can limit the timing, extent or even the use of prescribed fire within key habitat areas.

Challenges to non-fire fuels treatments include long-term management of the area treated, public perception of the treatment, and conflicts with management objectives with other BLM programs. Similar to the challenges that may restrict the use of prescribed fire within the planning area, wildlife habitat management can also restrict the use and extent of mechanical and chemical vegetation treatments.

3.3.3. Stabilization and Rehabilitation

The Burned Area Emergency Stabilization and Rehabilitation (ES&R) Plan is an interdisciplinary response to protecting natural resources and threats to human health and safety. The guidelines for development of this plan are outlined in BLM Handbook H-1742-1, *Burned Area Emergency Stabilization and Rehabilitation*.

Fires throughout the West have become much larger, have threatened the natural integrity of the burnt ecosystem, and have become a threat to human health and safety. The recovery of burned landscapes, especially from large, landscape-level fires, sometimes requires actions to maintain the integrity of the natural resources and the safety of adjacent communities. The need to stabilize and rehabilitate burnt areas has become increasingly important. Some areas do not successfully recover with native vegetation and become dominated by invasive plant species. Many communities adjacent to wildfires are threatened by erosion of bare soil, loss of public infrastructure, and contamination of water resources.

All wildfires are analyzed for the need to implement an ES&R Plan after the fire is contained. Indicators of the need for an ES&R Plan for a burn are areas of high-severity burns, steep terrain, high probability of proliferation of invasive plant species after the burn, and threats to human health and safety or loss of infrastructure. Relatively few fires in the planning area require a plan.

Table 3.32, “Emergency Stabilization and Rehabilitation Plans and Treatments in the Planning Area between 2000 and 2007” (p. 368) lists ES&R Plans developed for the planning area between 2000 and 2007. ES&R Plans were developed for wildfires such as the Pass Creek Fire (2002), the Arapahoe Fire (2002), and five other wildfires over the past 10 years. The plans for the Pass Creek and Purdy fires (USFS) were complex and addressed multiple threatened resources and values. Most of the plans are of relatively low complexity and have not required substantial funding to implement. Increased need for ES&R Plans has corresponded with the increase in larger fires. ES&R Plans have been developed and successfully implemented in the planning area to rehabilitate areas infested with cheatgrass, such as in the Twin Creek watershed.

Table 3.32. Emergency Stabilization and Rehabilitation Plans and Treatments in the Planning Area between 2000 and 2007

Fire name	Treatment Name	Treatment Category	Funding Source	Treatment	Fiscal Year
Poison Spider	Fence Repair	Fence Repair	Emergency Stabilization	2 miles	2007
	Rehabilitation-Road Signing	Protection	Emergency Stabilization	25 signs	2007
Arapahoe	Jeep Trail Closure	Erosion/Sedimentation	Suppression Activity Damage	20 acres	2003
	Rehabilitation-Road Signing	Roads	Rehabilitation	1 sign	2003
	Erosion Control Structures	Erosion/Sedimentation	Emergency Stabilization	75 acres	2003
	Temporary Fence	Erosion/Sedimentation	Rehabilitation	320 acres	2003
	Monitoring	Invasive Weeds	Rehabilitation	356 acres	2003
	Seeding	Erosion/Sedimentation	Emergency Stabilization	30 acres	2003
Pass Creek	Monitoring Weeds	Invasive Plants	Rehabilitation	4,725 acres	2003
	Monitoring Vegetation	Erosion/Sedimentation	Rehabilitation	4,725 acres	2003
	Rehabilitation-Road Signing	Roads	Rehabilitation	44 signs	2003
	Seeding	Erosion/Sedimentation	Emergency Stabilization	250 acres	2003
	Temporary Fence	Erosion/Sedimentation	Rehabilitation	600 acres	2003
Murphy Draw	Temporary Fence	Erosion/Sedimentation	Rehabilitation	5.75 miles	2001
	Monitoring Weeds	Invasive Plants	Rehabilitation	30 acres	2001
	Monitoring Vegetation	Erosion/Sedimentation	Rehabilitation	1,365 acres	2001
	Rehabilitation-Monitoring Weeds	Invasive Plants	Rehabilitation	30 acres	2001
	Seeding	Erosion/Sedimentation	Emergency Stabilization	200 acres	2001
	Rehabilitation-Road Signing	Protection	Emergency Stabilization	28 signs	2001
Cottonwood	Temporary Fence	Erosion/Sedimentation	Rehabilitation	1.6 miles	2000
	Rehabilitation-Monitoring Weeds	Invasive Plants	Rehabilitation	155 acres	2000
	Monitoring Vegetation	Erosion/Sedimentation	Rehabilitation	155 acres	2000
	Rehabilitation-Monitoring Weeds	—	—	30 acres	2000
	Seeding	—	—	155 acres	2000
	Rehabilitation-Road Signing	Protection	Emergency Stabilization	28 signs	2000
	Erosion Control Structures	Erosion/Sedimentation	Emergency Stabilization	10 waterbars	2000
Source: BLM 2009a					

Management Challenges for Stabilization and Rehabilitation

Fluctuations in precipitation patterns create management challenges for stabilization and rehabilitation. The affect of continual years of drought intermixed with years of average or slightly above average precipitation influences the need to develop ES&R plans following a wildfire. Additionally, increased drought, disease, and large wildfires create management challenges related to rehabilitation. The need for stabilization and rehabilitation in the planning area is predicted to increase as wildfires become increasingly larger and include more expansive high severity burned areas.

Impacts to water, soil, vegetation, and forests from larger wildfires increase the need for and importance of stabilization and rehabilitation. Areas with burned vegetation are vulnerable to erosion, especially due to fluctuations in precipitation patterns and the potential for severe storms associated with climate change.

3.4. Biological Resources

This section describes the biological resources in the planning area including vegetation, invasive species and pest management, fish, wildlife, special status species, and wild horses. Due to the complexity of biological resources and the size of the planning area, this section does not attempt to provide an encyclopedic description of all vegetation, fish, wildlife, and special status species in the planning area. Common names for species are used throughout this section and the rest of this document. A complete list of scientific names for species referenced in this document can be found in Appendix P (p. 1611).

Acreage reported for biological resources in the planning area in this section does not include the WRIR and USFS lands as the BLM does not manage these lands. However, these areas are depicted on the referenced maps in this document to provide a visual and geographic context for biological resources in the planning area. Important ecosystem components of biological resources include biological diversity and habitat fragmentation which are discussed below.

Biological Diversity

The Keystone Center (Keystone Center 1991) defines four elements of biological diversity relating to scale:

1. Genetic diversity
2. Species diversity
3. Community or ecosystem diversity
4. Landscape or regional diversity

Biological diversity is complex, and makes the measurement of existing conditions difficult. Species diversity is the most recognizable and easily understood element of biological diversity and in this document is defined as the variety of species found in the planning area. In other words, species diversity includes the numbers and distribution of all species in the planning area. This includes species (e.g., mule deer, elk, and pronghorn) that are common and plentiful, and other species (e.g., burrowing owl, mountain plover, and bald eagle) that are less common or are rare. Classifying rare species as sensitive, threatened, or endangered is one way of conserving biological diversity because these classifications heighten awareness for conservation of rare species.

Spatial and temporal scales are also important considerations for conserving biological diversity. For example, nonmigratory populations of mammals are sometimes temporarily diminished

following a harsh winter and limited food supply. In addition, migratory birds might return to breeding grounds with diminished populations due to the stresses associated with migration. In these cases, the lower number of individuals of wildlife populations does not necessarily equate to a reduction in biological diversity in the planning area because the number of individuals ultimately (all else being equal) return to pre-winter levels. For the purposes of this document, permanent reductions in the four elements of diversity listed above are considered adverse impacts to biological diversity.

Counting the number and relative frequency of species occupying an area over time is one means of identifying reductions in species diversity; however, this approach can be overly simplistic and does not necessarily address the other three elements of diversity. There is no single commonly accepted scientific protocol for measuring biological diversity. Nevertheless, it is generally accepted that "...reducing the number of biological entities in a system or making some of them less abundant reduces diversity" (Langner and Flather 1994).

Climatic factors (e.g., drought), disease, fire regime, predation, competition, and population cycles all have contributed to the existing natural variability in number and relative frequency of individuals, species, and communities of plants and animals in the planning area. Other factors include surface-disturbing activities (e.g., road and well pad construction), the physical and chemical environment (e.g., soil nutrients and water), adjacent area vegetation (e.g., croplands), historic vegetation, invasive species, herbivory (e.g., native ungulates and livestock), and existing vegetation in the planning area.

Existing conditions for biological diversity in the planning area is a function of physical factors (e.g., soils, geology, air, water, geography, and elevation), natural factors (e.g., fire, drought, disease, evolution), and human actions. In the context of these physical and natural factors, biological diversity evolved over time to produce the diversity in the planning area prior to European American settlement. Human actions during the subsequent 150 years changed the pattern, composition, structure, and function of plant and animal communities in the planning area, thus affecting the pre-European American biologically diverse settlement. Management challenges for biological diversity include competing resources and resource uses. Management actions to address these challenges are incorporated in the alternatives for physical and biological resources and for fire and fuels management in Chapter 2.

Habitat Fragmentation

As large contiguous blocks of habitat are bisected into smaller blocks, they become isolated from one another by dissimilar habitats and land uses. For example, a contiguous 100,000-acre block of sagebrush habitat is considered fragmented when a road or other development is constructed through the habitat, thereby bisecting the block. If, in this example, the road bisects the 100,000-acre block in half, the result of this fragmentation is two 50,000-acre blocks of sagebrush habitat bisected by a road. As blocks of habitat are repeatedly bisected into smaller blocks, there can be adverse impacts, including isolation, to individual plant and animal species and communities occupying the habitat. The impacts to biological resources from habitat fragmentation can occur on multiple scales.

Actions that result in habitat loss are exacerbated when fragmentation reduces the size and/or isolates remaining habitat patches below size thresholds necessary to support particular species. Some species are area-sensitive and habitat loss and fragmentation that reduces or isolates their area thresholds likely affects their distribution and abundance in the planning area.

The planning area habitat is fragmented by linear features, including roads, trails, irrigation systems, and ROWs. A network of state highways, county roads, and local roads on private and public lands cross portions of the planning area. Fences can also block migration routes for wildlife species such as pronghorn, consequently fragmenting their habitats. The conversion of large areas of sagebrush to predominately grassland communities can fragment habitat for sagebrush-dependent species such as the greater sage-grouse.

Habitat fragmentation in the planning area is most prevalent along the linear features identified in the previous discussion; however, fragmentation also occurs at population centers, reservoirs, and other developments where humans live, recreate, and work. For example, the development of private parcels bordering BLM-administered lands has, in some instances, contributed to habitat fragmentation by the conversion to subdivisions or smaller ranchettes. This type of land conversion and habitat fragmentation primarily occurs near population centers and the WUI. Buildings, roads, fences, and utility corridors associated with residential and commercial developments have all contributed to habitat fragmentation in the planning area.

In addition to the linear features and other types of development, conditions on BLM-administered land continue to be influenced by the management of resources and resource uses, including mineral resources; fire and fuels management; forests, woodlands, and aspen communities; and land resources. Refer to the appropriate sections in this chapter for additional details regarding existing conditions for these resources and resource uses.

In general, development and the associated construction and maintenance of roads, railroads, well pads, pipelines, and powerlines has fragmented habitat in the planning area. In addition, wildland fires have sometimes contributed to temporary habitat fragmentation. Intense and large area burns can temporarily isolate individual species and communities of plants and less mobile species of animals. A frequent fire return interval often associated with invasive species can effectively fragment habitat over the long term. Similar to fire, mechanical vegetative treatments have generally been temporary. Motorized vehicle use also can contribute to habitat fragmentation through the transportation of invasive species seeds.

Vegetation

The last ecological condition inventory in the planning area occurred between 1982 and 1983 using vegetation and soil information collected during the range site inventory and applying this information to the Soil Conservation Service's (now known as the Natural Resources Conservation Service) method of calculating range condition. Results indicated that 6 percent (53,241 acres) was in excellent condition, 52 percent (505,272 acres) was in good condition, 33 percent (327,581 acres) was in fair condition, and 6 percent (53,338 acres) was in poor condition. Three percent (25,726 acres) was placed in an unclassified category. However, these results were only identified for a portion of the planning area, which consisted of the Gas Hills, East Fork, Dubois Badlands, Whiskey Mountain, and Dubois Area Management Units. For the remaining portion of the planning area, the Green Mountain Management Unit, the previous planning document only estimated that "70 to 80 percent of the area was in fair to low-good condition with a static to upward trend" (BLM 1982).

At present, approximately 45 percent of the planning area has been evaluated for compliance with the Wyoming Standards for Healthy Rangelands (BLM 1997b). These assessments indicated that 75 allotments (280,006 acres) are meeting the standards and 41 allotments (776,671 acres) are not meeting one or more standards as a result of grazing, and 194 allotments (1,056,677 acres) have not been assessed. Table K.3, "Lander Field Office Grazing Allotments Assessed for Meeting

Standards” (p. 1569) identifies the allotments that have been evaluated, and the results of those evaluations. Monitoring of rangelands is conducted primarily by the field office Rangeland Management staff, which generally documents use levels, conditions, and trends in rangeland attributes in coordination with current processes, such as the Wyoming Standards for Healthy Rangelands and grazing permit renewals. Over time, the BLM intends to continue assessing grazing allotments through a landscape approach, as discussed in Section 3.6.5, “Livestock Grazing Management” (p. 479) of this document.

In many cases throughout the planning area, vegetation communities are “locked” into a stable state of range condition in the early to mid seral states. It might take a disturbance event, such as fire or mechanical treatment, to improve the current seral status or state.

There are three major types of vegetative communities in the planning area: forest and woodland communities, grassland and shrubland communities, and riparian-wetland communities. These communities are identified on Map 45.

Precipitation patterns and zones play an important role in the functions and types of vegetative communities (Map 44).

- The Wind River Basin is in the 5- to 9-inch precipitation zone, with some inclusions in and around the town of Shoshoni where precipitation might be less than 5 inches annually.
- Most of the area of increasing elevation up Beaver Rim into the Sweetwater Valley is in the 10- to 14-inch High Plains East precipitation zone.
- Areas in the higher elevation portions of the Green Mountain physiographic feature, the Rattlesnake Mountain Range, and the Copper Mountain and Bridger Mountain Range area receive more than 15 inches of precipitation annually. These areas are unique oases of the intermountain cold desert shrublands that dominate the area.
- The Lander Slope and Twin Creek areas are characterized by both the 10- to 14-inch and the 15-inch+ precipitation zones, with ecological sites that portray those areas.
- The Dubois area is mostly in a rain shadow, but all precipitation zones found in the planning area are within a very short distance. As elevation increases, precipitation changes dramatically from a desert environment in and around Dubois to a spruce/fir/aspen community in the Ramshorn Peak area near the headwaters of Tappan Creek.

Table 3.33, “Acreage of Vegetative Communities in the Planning Area” (p. 373) lists the acreage for plant communities in the planning area based on Wyoming GAP Analysis data (BLM 2012a).

Table 3.33. Acreage of Vegetative Communities in the Planning Area

Vegetative Type	Total Acreage	BLM-Administered surface acreage	Percent BLM-administered surface acreage
Grasslands	276,142	177,156	7.4
Sagebrush	2,396,517	1,770,153	73.9
Conifer (ponderosa/lodgepole pine forests)	34,232	19,058	0.8
Desert shrubs and saltbush-greasewood flats	301,833	231,746	9.7
Juniper/limber pine, and aspen (woodlands)	67,268	42,803	1.8
Mountain shrubs	94,410	70,518	2.9
Riparian-wetland	131,684	54,292	2.3
Other (rockland, disturbed Area, water, unclassified)	45,120	25,416	1.1
Totals	3,347,206	2,391,142	-
Source: BLM 2012a			
Note: Percentages might not sum to 100 due to rounding; totals for acreage columns do not equal total planning area and total BLM-administered land in the planning area due to differences in source files for boundary and for vegetation.			
BLM Bureau of Land Management			

The USDA NRCS developed Major Land Resource Areas (MLRAs) as a way to classify geographic areas with similar elevation, topography, geology, climate, water, soils, biological resources, and land use (USDA 2006). The planning area lies within three MLRAs (Map 45), as described below:

1. MLRA 32 – Northern Intermountain Desertic Basins (5- to 9-inch and 10- to 14-inch precipitation zones) – MLRA 32 occupies the lowest elevations and includes salt desert environments and soils that support sagebrush but not large contiguous stands. This MLRA has the longest growing season in the planning area, but is also the driest.
2. MLRA 34A – Cool Central Desertic Basins and Plateaus (7- to 9-inch and 10- to 14-inch precipitation zones) – While many MLRAs in Wyoming support sagebrush, MLRA 34A forms the core of sagebrush habitat in Wyoming. This is the most intact tract of sagebrush remaining in the world. Virtually everywhere else the sagebrush biome is fragmented and threatened. Green Mountain, and to a lesser extent Crooks Mountain, have the alpine characteristics associated with MLRA 43B, but the region is too small to map separately on the scale appropriate for MLRAs.
3. MLRA 43B – Central Rocky Mountains (15- to 19-inch and 20-inch+ precipitation zones) – MLRA 43B is an alpine environment. It has the shortest growing season and the highest precipitation in the planning area. It includes the Wind River Front and the south slopes of the Owl Creek and Copper Mountains. Much of this MLRA is forest or mountain shrub vegetation types.

Each MLRA contains a set of “Ecological Sites,” which describes the land capability and function based on precipitation zones, soil factor differences that determine plant production and composition, site hydrology, functioning of the ecological processes of the water cycle, nutrient

cycles, and energy flow. Different ecological sites exhibit differences in the number and relative proportion of species and total annual vegetation production.

Ecological site descriptions are used as the initial basis for determining the existing and potential range of conditions for each site. State and transition models are used to develop objectives and guide management actions necessary to meet the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)). State and transition models describe the anticipated vegetation changes on a given site over time in response to various types of disturbances and environmental factors (NRCS 2003).

Vegetative Conditions

Appendix Q (p. 1617) provides a general discussion of vegetative conditions in the planning area. The appendix provides an estimate of vegetation conditions based on data from existing vegetation, fire regime groups, FRCC from regional LANDFIRE data, and estimates from ground level conditions. The coarse scale, landscape level assessment of the condition classes for vegetation types in the planning area was conducted in 2001 for the purpose of describing the Fire Regime Group and the Landscape Level FRCC, and to provide the only planning area wide inventory available for determining the ecological condition of vegetation communities. The LANDFIRE database description of the ecological condition of vegetation communities was used because the Lander Field Office has not completed a forest and woodlands inventory, and there has not been an Ecological Site Inventory of grassland and shrubland conditions in more than 35 years. This assessment technique does not provide useful information for riparian-wetlands, as the scale is too broad.

While the information provided in Appendix Q (p. 1617) provides broad information that can be informative at the RMP level of analysis, up-to-date inventories are still needed. Refer to the *Fire and Fuels Management* section for additional information on the FRCC system.

3.4.1. Vegetation – Forests, Woodlands, and Aspen Communities

Approximately 61,861 acres, or 2.6 percent, of BLM-administered surface in the planning area consists of forest and woodland communities (including juniper/limber pine and aspen woodlands and conifer forests) (Map 45). Overall, forest and woodland health throughout the West is declining. Drought conditions, hotter summers and fewer deep winter freezes have stressed forest and woodland communities and made them more susceptible to insect and disease outbreaks. Related to changing climatic conditions, 100 years of fire suppression has altered the ecology of the existing landscape. Evidence of the combination of these factors include juniper encroachment, conifer stands decimated by pest infestation, and the decline of aspen stands. Loss of aspen stands have been reported throughout the west, with the highest mortality occurring in areas where aspen is a mid-seral species (Bartos and Campbell 1998).

Age-class distribution, diversity, fire return intervals, as well as pine beetle and other infestations, are key indicators of forest and woodland health. Aspen, because of its importance as a vegetative resource for wildlife habitat, serves as an overall indicator species for forest and woodland health.

Forest Communities

Forest communities comprise approximately 19,058 acres of BLM-administered surface, or less than 1 percent of the planning area. Forest communities in the planning area are dominated by lodgepole pine with some confined Douglas-fir and Engelmann spruce stands, and are primarily

found north of Dubois and Lander, and in the South Pass and Green Mountain areas. The importance of these forest stands is a function of their distribution, relatively long rotation age (number of years to maturity), and the diversity of plants and animals they support. Age-class distribution of forested lands is tending toward mature, heavily stocked stands with younger age-class stands in smaller areas that have burned over the past 30 years or have had some logging activity over the past 40 years. Portions of these older and more mature stands remain healthy, but many are declining in tree vigor and productivity. The advanced age and density of these stands, combined with the lack of vegetative treatments and altered fire regime, have contributed to the decline in overall forest stand health. Vegetative treatment includes methods to manage natural processes, insects and diseases, structure, density, species composition, age-class distribution, and site quality of forest stands.

The age-class distribution of lodgepole pine stands is largely a result of past logging activities and, to a lesser extent, the influence of wildland fires and wind throw. Except where there has been recent (within approximately the last 50 years) disturbance, lodgepole pine is primarily even-aged stands between 100 and 200 years old with size classes of pole (5- to 9-inch diameter breast height) and medium saw timber (9- to 21-inch diameter breast height). Old-growth characteristics are generally not applied to lodgepole pine.

Lodgepole pine is stressed by mountain pine beetle and dwarf mistletoe infestations in scattered patches throughout the planning area. Forested lands adjoining the planning area exhibit more pest damage than in the planning area itself. The mountain pine beetle has most heavily affected the Dubois area, but there are signs of disease on Green Mountain and Lander Slope. Funding levels provide little scope for management response to the spread of the mountain pine beetle. The BLM works with the Shoshone National Forest and the community of Dubois to control pine beetle infestations.

Douglas-fir and Engelmann spruce are minor components of forested areas. Douglas-fir stands are found in the South Pass, Lander Slope, and Dubois areas and are restricted to limestone derived calcareous soils of the Wind River Slope. Some of the Douglas-fir stands in the Mexican Creek area of Lander Slope display old growth characteristics with basal bark scarring from past fires and age classes in excess of 300 years. Engelmann spruce is limited to forested drainage bottoms. Small stands are found on Green Mountain, Lander Slope, South Pass, and in the Dubois area. Neither Douglas-fir nor Engelmann spruce display the degree of infestation and mortality that is affecting lodgepole pine and limber pine.

Woodland Communities

Woodland communities comprise approximately 42,803 acres, or 1.8 percent of BLM-administered surface in the planning area. Woodlands include limber pine, Rocky Mountain and Utah juniper stands, aspen stands, and cottonwood galleries along waterways. In general, distribution of aspen has decreased, while limber pine and juniper stands have increased.

Identified woodland areas are on the Lander Slope, Green Mountain, Copper Mountain-Lysite Mountain area, the Beaver Creek-Twin Creek area, the Sweetwater Rocks, the Dubois/Wind River area, and portions of the Rattlesnake Range. Juniper/limber pine woodlands occur in the Beaver Creek and Twin Creek areas. Limber pine has been more acutely impacted by disease than other woodland species in the planning area. There is no whitebark pine in the planning area, and as such management does not address this BLM sensitive species; see the Wyoming sensitive species list for locations of other sensitive species (NRCS No Date). Extensive herbivory has

adversely impacted aspen stands in numerous areas, including on Green Mountain and Beaver Rim. The long-term lack of fire necessary to regenerate aspen stands has also been detrimental.

Aspen is scattered throughout the planning area, although most stands are maturing and distributions are declining. Most of the aspen occurs within forest and woodland sites in mid-seral communities that naturally transition into conifer stands before a disturbance, such as fire, returns the stands to early- and mid-seral aspen dominated woodland communities. Aspen stands typically exhibit a diversity of understory vegetation, are used by wildlife and livestock, can serve as natural fire breaks, and often occur as part of important riparian-wetland components in the forest system. Older aspen stands are showing signs of increased cankers, conks, and decay in the boles, and generally have little clone regeneration due to competition from conifers and herbivory from wildlife and livestock. The healthiest aspen stands are on Lander Slope and in the Dubois area, probably due to the extensiveness of the forested landscape and the lack of concentrated browsing pressure; the largest acreage of this community occurs in the Green Mountain area.

Much of the aspen at middle to high elevations is declining as succession to conifer dominance proceeds. In the absence of treatment or re-generation through fire or other landscape-wide event, this trend would continue. The loss of deciduous forestland affects watershed and riparian-wetland function and the diversity of habitat. Slowing the landscape level loss of aspen is a high management priority and is being addressed by aspen regeneration projects using the most recent aspen inventory data.

Forest Products

Forest product sales in the planning area are minimal with total receipts of \$4,209 in 2005, \$4,956 in 2006, \$5,513 in 2007, and \$5,478 in 2008 (fiscal years). These receipts were mainly from sales of fuel wood permits, Christmas tree permits, and post and pole permits.

Management of Forests, Woodlands, and Aspen Communities

Forest Communities

Forestlands in the Lander Slope-Red Canyon, South Pass, Whiskey Mountain, and East Fork areas are under restricted management for forest products due to access and topographical limitations (steep slopes) associated with forest management in these areas. The BLM manages stands in the WUI to reduce hazardous fuel loading. Refer to the *Fire and Fuels Management* section for information on planned/prescribed fire and non-fire treatments by FMU in the Southern Zone Fire Management Plan (FMP) (BLM 2004b) (Appendix O (p. 1605)).

The BLM has attempted to increase forest sales in recent years to address fuel loading and beetle kill. There is an opportunity to combine the BLM harvest with other state, private, and federal agency harvests where jurisdictional boundaries cut through larger sale areas. The Healthy Forest Initiative of 2002 and the subsequent Healthy Forest Restoration Act of 2003 promotes expediting fuels reduction and forest restoration and entering into stewardship contracts under which contractors would harvest wood products and complete service work such as thinning trees and removing dead wood (BLM 2009a). In the planning area, however, there is a weak demand for the forest products that could be garnered through these stewardship contracts (with the exception of the Dubois area, where there is currently a demand for all types of forest products).

The demand for minor wood products such as firewood, posts and poles, and Christmas trees is likely to continue and could be a tool to manage areas, such as Green Mountain, that would

benefit from thinning. However, the cost in time and fuel to drive to Green Mountain makes this area much less desirable to those interested in forest products from the Lander area than closer areas in the Lander Slope and South Pass areas.

Woodland Communities

The BLM manages 42,803 acres of woodlands in the planning area to enhance other resources. Management includes enhancement of aspen stands through the removal of encroaching limber pine and juniper from mountain shrubland habitat. Future site-specific inventories would identify additional acres of these vegetative types because of woodland encroachment on shrublands.

The Green Mountain area has the largest acreage of aspen within the planning area, with over 6,000 acres. Treatment has averaged approximately 50 acres annually since 2006. This level of treatment is not sufficient to maintain and enhance the health of this community type, but with proper funding and staffing to issue larger aspen health contracts and utilize tools (e.g., the Stewardship Contracting Authority and service contracts), greater benefits to aspen communities could be achieved. Barring any major surface disturbance, conifers would eventually replace most of the aspen stands, impacting overall forest health, wildlife habitat requirements, and visual resources (Wyoming State Forestry Division 2001). Major disturbance to woodland communities include wildland fires, and mountain pine beetle or other insect infestations; which can result in massive losses of woodlands.

Management Challenges for Forests, Woodlands, and Aspen Communities

Management challenges for forests, woodlands, and aspen communities include the lack of a natural fire regime, limited fuels management, fragmented and isolated stands, encroachment of woodland species, lack of an up-to-date inventory, a weak local and regional demand for sawlogs, declining or over-mature stands, and management of disease, insects, pathogens, and invasive species. Fragmented vegetative communities generally suffer from these declining conditions more than other vegetative communities.

Mountain pine beetle infestations can result in management challenges for forests, woodlands, and aspen communities as conifers have very little defense against infestation and entire stands can be destroyed by a single brood of pine beetles. Mountain pine beetles infestations result in substantial changes in species composition and an altered fuels complex. Early pine beetle infestations result in an increase in the amount of fine surface fuels compared to endemic stands. In post infestation stands, large, dead, wood fuels, and live surface fuels dominate. Infestations of pine beetles can increase the occurrence, rate of spread, and intensity of fires that affect forests, woodlands, and aspen communities.

The impacts of climate change might also be contributing to management challenges associated with disease, drought, infestation, habitat fragmentation, and other issues. Refer to the *Climate Change* section at the end of this chapter for additional information on the potential impacts of climate change in the planning area.

3.4.2. Vegetation – Grassland and Shrubland Communities

The sagebrush biome, which consists of grassland, sagebrush, mountain shrub, and desert shrub and saltbush-greasewood flats vegetative types (Table 3.33, “Acreage of Vegetative Communities in the Planning Area” (p. 373)) comprises 2,249,573 acres, or 94 percent of the BLM-administered surface in the planning area. The sagebrush biome has become increasingly

important as it is lost throughout the western United States to development, urbanization, and fragmentation. For decades, the objective was to convert sagebrush steppe, whenever it could be done in a cost-effective manner, to crops or grassland. In the Great Basin, altered fire regimes from cheatgrass infestation have removed approximately half of the sagebrush in the last few decades.

Sagebrush plays an especially important role in relation to greater sage-grouse, which is declining in population and distribution across much of its range. Native herbivores, including bison, were present in low numbers on the sagebrush-steppe region prior to European settlement of the western states (Miller et al. 1994), and greater sage-grouse co-evolved with these animals (USFWS 2010). Native vegetation communities within the sagebrush ecosystem evolved in the absence of substantial grazing presence (Mack and Thompson 1982, Miller et al. 1994). These same plant communities are not adapted to domestic grazing disturbance. Grazing has changed the functioning of these systems into less resilient, and in some cases, altered communities (Knick et al. 2011). Sagebrush in the planning area remains largely intact and the Lander Field Office is positioned to ensure the proper functioning of the biome (Map 45).

Alteration of the herbaceous community due to long-term impacts from livestock grazing, and a reduction in the influence of natural disturbances such as fire across the landscape, has likely increased sagebrush cover within these communities. Upland sagebrush steppe Historic Climax Plant Communities of the Ecological Site Descriptions (USDA-NRCS) found in the planning area is generally 75 percent grasses, 10 to 15 percent forbs, and 10 to 15 percent shrubs by weight.

Standard 3 of the Wyoming Standards for Healthy Rangelands states that upland vegetation on each ecological site should consist of plant communities appropriate to the site which are resilient, diverse, and able to recover from natural and human disturbance (Appendix J (p. 1537)). Indicators used to assess upland vegetation health include vegetative cover, plant composition and diversity, bare ground and litter, erosion, water infiltration rates, and invasive species. Refer to the *Livestock Grazing Management* section of this chapter for additional information on the Wyoming Standards for Healthy Rangelands.

Most vegetative communities have been influenced by surface-disturbing activities, livestock grazing, and fire or fire suppression. As mineral developments and pipeline projects increase, sagebrush and grassland conditions are increasingly affected.

Existing management practices for upland grass and shrub communities are addressed primarily through monitoring livestock grazing, evaluating terms and conditions of individual grazing permits, and the development and implementation of Allotment Management Plans (AMPs). As discussed in the *Livestock Grazing Management* section, the impacts of drought, climate change, and mineral development on grass and shrub communities have been historically overlooked. Moreover, short-term indicators, such as stubble height of vegetation in riparian-wetland areas and utilization on uplands, are only useful for determining whether livestock grazing may continue in a given season, unless they are correlated to long-term trend data establishing a cause and effect relationship. Long-term indicators, such as upland condition and trend studies are in place for some high priority “Improve” category grazing allotments, but are lacking in other allotments. Standards assessments of vegetative condition need to be completed to evaluate health and trends.

Grasslands

Grasslands comprise 177,156 acres, or 7.4 percent of BLM-administered surface in the planning area and include lowland, foothill, mountain, and alpine types. Most of the grassland areas are in

valley bottoms, uppermost south facing slopes, and scattered patches on windswept ridges, such as the bighorn sheep habitat on Whiskey Mountain in Dubois.

The average composition of the grass vegetative type is 48 to 80 percent grass species, 10 percent forbs, and 10 to 42 percent shrubs. Most of the grasslands on BLM-administered surface are in a mid to late seral stage of plant succession, generally comprised of a lower percentage of grass and herbaceous species and a higher percentage of shrubs compared to the historic climax plant community. This condition is due to a number of factors, including, but not limited to, the lack of disturbance from fire and historic livestock grazing that could have altered site species composition. Grasses comprise only 7.4 percent of BLM-administered surface in the planning area, but are important to wildlife, livestock, and wild horses and contribute to the diversity of the area. Open grasslands are important components in bighorn sheep habitat. The typical habitat types included in this vegetative type are highland short grass, sagebrush mixed grass, lowland short grass, and sagebrush mixed shrub.

Shrublands

Sagebrush (1,770,153 acres, or 74 percent of BLM-administered surface) is the most common vegetative type of the shrubland communities. The average species composition varies widely across the sagebrush landscape, depending on soil classification and average annual precipitation. Much like the BLM-administered grasslands, shrublands are generally in a mid to late seral stage of succession, comprised of a lower percentage of herbaceous grass and grass-like species and a higher percentage of shrubs compared to the historic climax plant community. An estimate for most mid-seral sagebrush communities within the 10- to 14-inch precipitation zone is 50 to 65 percent grass, 5 to 10 percent forbs, and 15 to 35 percent shrubs.

There are multiple sagebrush species in the planning area. Basin sagebrush and silver sage are discussed in the *Riparian-Wetland Resources* section. Bud sagebrush is identified in the discussion of saline upland sites. Threetip sagebrush is present on clay soils and is common along Lander Slope, although uncommon elsewhere. Low and black sagebrush are found on shallow soils. Big sagebrush is the most widely recognized sagebrush.

Big sagebrush includes two subspecies of similar appearance, including mountain big sagebrush and Wyoming big sagebrush. Only Wyoming big sagebrush occurs in the 5- to 9-inch precipitation zone. Both subspecies occur in the 10- to 14-inch precipitation zone, and mountain big sagebrush dominates the 15- to 19-inch precipitation zone. Age class studies of sagebrush stands indicate that most of the planning area is dominated by monotypic old age class sagebrush approximately 80 to 100 years old or greater.

Big sagebrush is a biome level plant that supports a variety of obligate species such as greater sage-grouse, pygmy rabbits, and vesper sparrows. Many species, such as mule deer, pronghorn, and ferruginous hawk, are not sagebrush obligates, but occupy ranges closely correlated with sagebrush. Domestic sheep graze sagebrush, especially on winter ranges.

Almost all big sagebrush communities can support an understory of cool season bunchgrasses. Needle and thread is the key grass species on sandy soils; bluebunch wheatgrass is more prevalent on loamy sites. These large cool season bunchgrasses occur in conjunction with a mix of smaller grasses such as thickspike wheatgrass, Sandberg bluegrass, and prairie junegrass. Cool season bunchgrasses complete over 90 percent of their growth in a relatively short period, primarily in May. When subjected to repeated heavy grazing use during that short growth period, the preferred cool season bunchgrasses tend to decline as a part of the plant community, after which

more grazing adaptive species such as Sandberg bluegrass and threadleaf sedge become the predominant component of the herbaceous community (Cagney et al. 2010).

Depending on location and soil type, blue grama or upland (needle leaf or threadleaf) sedges usually prevail instead of smaller grasses. Blue grama is a warm season grass that produces a minimum amount of forage and ground cover. Sagebrush communities are increasingly vulnerable to cheatgrass infestations, especially in MLRA 32. Cheatgrass appears to be expanding its range in the planning area. While cheatgrass is relatively uncommon in MLRA 43A, no area occupied by sagebrush in the planning area is outside of its reach.

Plant succession in big sagebrush communities is complex, and cool season bunchgrasses, if lost from a given site, do not readily reemerge on sites unless niches are opened through sagebrush treatments. Because greater sage-grouse habitat is a prime concern, sagebrush treatments might or might not be appropriate, and prescribed fire should be used only with great care.

Mountain shrub communities (70,518 acres, or 2.9 percent of BLM-administered surface) occur primarily in the 15- to 19-inch precipitation zone. Mountain big sagebrush, bitterbrush, and snow berry are the key species. Mountain mahogany sometimes occurs, mostly in conjunction with Utah juniper on rocky outcrops in lower-precipitation zones. The grass component includes needle grasses, mountain brome, and Idaho fescue. Arrowleaf balsamroot is a key forb. Mountain shrub areas provide forage for livestock and wildlife, particularly mule deer.

Salt desert habitats (231,746 acres, or 9.7 percent of BLM-administered surface) consisting of desert shrubs and saltbush-greasewood flats are found in two basic forms, saline upland and saline lowland. Saline upland sites are found along the base of Beaver Rim and in the northeast portion of the planning area. These sites are dominated by Gardner's saltbush, often with bud sagebrush. If the salt content is not too severe, these sites have a herbaceous component that includes thickspike wheatgrass and Indian ricegrass. On the edge between a saline upland site and a loamy site, Wyoming big sagebrush and bottlebrush squirreltail can intermingle with the salt tolerant species. They offer high levels of protein in the fall and winter making these sites winter range for livestock and wildlife, particularly domestic sheep and pronghorn. When saline soils are disturbed, reclamation efforts are difficult.

When saline upland sites are subject to improperly managed grazing, the herbaceous component declines and pure stands of Gardner's saltbush develop. The higher the salt content in the soil, the more vulnerable these sites are to this transition. Saline upland sites are also vulnerable to the invasive plant species halogeton. In most circumstances, halogeton is an opportunistic species that occupies disturbed sites. However, halogeton does have the ability to advance onto undisturbed saline upland sites. Saline lowland sites are dominated by greasewood, with variable amounts of basin big sagebrush that decline with increasing salinity as the amount of greasewood increases.

Rockland

This "vegetative" type covers approximately 10,828 acres, or less than 1 percent of the BLM-administered surface in the planning area. Sites include areas of unharvestable trees or brush and rocky or barren areas with little or no potential for agricultural activities due to inaccessibility or a lack of forage production. Typical rockland sites are Sweetwater Rocks, Copper Mountain, and Green Mountain. These areas are used by wildlife for escape and thermal cover and by recreationists.

Management Challenges for Grassland and Shrubland Communities

Management challenges for grassland and shrubland communities include addressing impacts associated with surface-disturbing activities, livestock grazing, and fire or fire suppression. As mineral developments and pipeline projects increase, sagebrush and grassland conditions are adversely impacted. Additional factors such as drought and climate change have been historically overlooked. Moreover, short-term indicators such as stubble height of vegetation in riparian-wetland areas or utilization on uplands are only useful for determining whether livestock grazing may continue in a given season, unless they are correlated to long-term trend data establishing a cause and effect relationship. Long-term indicators, such as upland condition and trend studies that would provide long-term information are in place to “Improve” category grazing allotments, but are lacking in other allotments.

Shifting precipitation patterns and potential climate change cause additional management challenges in grassland and shrubland communities. Cool season bunchgrasses do not resume growth if their spring growing season is aborted due to drought, even if ideal climate conditions for growth return. In the absence of any climate change, Wyoming undergoes climatic shifts in precipitation, which requires monitoring, observation, and timely inventories of rangelands to ensure proper responses to changes are implemented. Refer to the *Climate Change* section at the end of this chapter for additional information on climate change in the planning area.

Increased surface disturbance from human actions, drought, and erosion have lead to the establishment and spread of invasive species in grassland and shrubland communities, resulting in additional management challenges. The mostly arid climate of the planning area affords little reserve moisture during times of prolonged drought. Although native plant communities adapted to cope with natural shifts in precipitation from wet to dry, human intervention and climate change are altering that relationship. The loss of soil through wind and water erosion can remove nutrients and organic matter from the ecosystem and affect grassland and shrubland communities potentially impacting the health and viability of existing plant communities

Management challenges for grassland and shrubland communities also result from grazing. Historic overuse of the rangeland and concentration on riparian-wetland areas by season long livestock grazing have led to plant communities that are not meeting the potential for the site, and possibly resulting failure to meet the Wyoming Standards for Healthy Rangelands. In some areas, range site vegetation has crossed a threshold and moved to a different transitional state. It might not be possible to restore these areas through rest and/or management and they might require mechanical intervention. Refer to the *Livestock Grazing Management* section of this chapter for additional information.

Increased mineral development is affecting range conditions. Invasive plant species such as halogeton have slowly made their way into these areas. Once established, halogeton tends to spread, displacing desirable species. In the past, there was little monitoring and enforcement of reclamation activities and some mines were abandoned without reclamation. Historic mining areas are slowly being reclaimed with mixed success under a variety of programs.

3.4.3. Invasive Species and Pest Management

Invasive species is defined as “a species that is nonnative to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental health or harm to human health” (NISC 2008). State of Wyoming Designated noxious weeds are those plants that are considered detrimental or poisonous and have been placed on the Wyoming designated noxious weed list by the procedure provided for in the Wyoming Weed and Pest Control Act of

1973. Typically, these weeds are perennial or biennial, difficult to control, and usually interfere with agriculture. The State of Wyoming designates six animal species and 25 plant species as pests and noxious weeds. This list is dynamic and additions to it are made as necessary by the Wyoming Board of Agriculture and the Wyoming Weed and Pest Council. Declaring a plant, insect, or rodent to be an invasive weed or pest allows for joint funding for control and assistance through the established state statute. Most of the weeds found on this list are capable of producing monotypic stands as they may process a competitive advantage in establishing on disturbed soils; also, some are allelopathic, producing or accumulating toxins to keep the seeds of other species from germinating. There are 30 additional plant species listed by adjoining states as noxious weeds, bringing the total list to 55 plants that are weedy in Wyoming or bordering states. A number of other species are of concern for the community. The result is a list of approximately 75 species of interest. Table 3.34, “Wyoming Weed and Pest Control Act Designated List” (p. 382) lists the Wyoming Weed and Pest Control Act designated invasive plant and pest species.

In 2007, invasive vegetation and invasive plant species were determined to be the dominant vegetation on an estimated 35 million acres of public lands in the western United States (BLM 2007c). In 1996, the spread of invasive plants on all western public lands was estimated to be 2,300 acres per day (BLM 1996). It is difficult to estimate the damage invasive species cause; however, as early as 1992, invasive species were determined to result in \$2 to \$3 billion in crop losses alone (NISC 2008). West Nile virus (WNV) is an invasive pathogen which, from 1999 to 2008, had caused 1,134 deaths in the U.S. (Lindsey et al. 2010). WNV is further discussed in the *Health and Safety* section. Executive Order 13112, established the Invasive Species Advisory Committee to represent diverse constituencies around the nation in the development of an invasive species plan. Completed in 2001, the plan has subsequently been updated with a five-step approach to addressing invasive species: prevention, early detection and rapid response, control and management, restoration, and collaboration (BLM 2009a).

Table 3.34. Wyoming Weed and Pest Control Act Designated List

Wyoming Invasive and Noxious Weeds		
Canada thistle	Houndstongue	Russian knapweed
Common burdock	Leafy spurge	Russian olive
Common St. Johnswort	Musk thistle	Scotch thistle
Common tansy	Ox-eye daisy	Skeletonleaf bursage
Dalmatian toadflax	Perennial pepperweed	Spotted knapweed
Diffuse knapweed	Perennial sowthistle	Tamarisk
Dyers woad	Plumeless thistle	Yellow toadflax
Field bindweed	Purple loosestrife	—
Hoary cress (whiteweed)	Quackgrass	—
Designated Pests		
Beet leafhopper	Ground squirrel	Mountain pine beetle
Grasshopper	Mormon cricket	Prairie dog

Source: Wyoming Board of Agriculture and the Wyoming Weed and Pest Council 2010

Other designated plant species, such as black henbane, larkspur, and halogeton, are of special concern because they are poisonous. Under state law, local weed and pest districts can declare additional species to be a weed or pest in their district. Table 3.35, “Declared List of Weeds and Pests by Counties in the Planning Area” (p. 383) identifies the secondary declared weeds as of 2010 by county weed and pest district.

Table 3.35. Declared List of Weeds and Pests by Counties in the Planning Area

Species	Fremont County	Carbon County	Natrona County	Sweetwater County
Army cutworm	No	No	No	Yes
Black henbane	No	No	Yes	Yes
Buffalobur	No	No	Yes	No
Cheatgrass	No	No	Yes	No
Curlycup gumweed	No	No	Yes	No
Foxtail barley	No	No	Yes	Yes
Halogeton	No	Yes	Yes	No
Lady's bedstraw	No	No	No	Yes
Mosquito	Yes	Yes	Yes	Yes
Mountain thermopsis	No	No	No	Yes
Plains larkspur, Geyer larkspur	No	Yes	No	No
Plains prickly pear	No	Yes	No	No
Poplar bud-gall mite	No	No	No	Yes
Puncturevine	No	No	Yes	No
Russian olive	Yes	No	No	No
Showy milkweed	No	No	Yes	No
Swainsonpea	Yes	No	No	No
Wild licorice	No	No	Yes	Yes
Wyeth lupine	No	Yes	No	No
Source: Wyoming Department of Agriculture 2010				

As of 2007, there were 11,547 acres of BLM-administered surface in Fremont County identified as infested with invasive plant species (BLM 2009a). These infestations were found to include black henbane and Swainsonpea. The primary location of leafy spurge infestation in the planning area is on the Lander Slope. Natrona County has approximately 500 acres of infestations, primarily leafy spurge. Other invasive plants like common burdock, perennial pepperweed, bull thistle, and sulfur cinquefoil are found in the planning area, but rarely, if ever, on BLM-administered public lands. There are also biennial thistles in the Forest oil field area. Map 46 shows the locations of identified invasive species in the planning area. Additional information is available through the Fremont County Weed and Pest District (Fremont County Weed and Pest District 2009).

Sweetwater County does have some problems with invasive species; black henbane is present on roads and pipeline ROWs and is the major concern in this area. This part of the Great Divide Basin contains primarily annual invasive plants on disturbed ground such as cheatgrass, halogeton, and Russian thistle. There are also biennial thistles in the Forest oil field area. Black henbane is the invasive plant of concern that appears to be spreading with the increasing oil and gas related surface-disturbing activities in Sweetwater County.

The Lander Field Office controls invasive species on the public lands through cooperative agreements with the Fremont and Natrona Weed and Pest Control Districts. In addition to the county weed and pest control districts, the Lander Field Office works in cooperation with the WGFD, State Lands Division, State Parks, local NRCS offices, and private landowners. Invasive species are an increasing problem in the planning area and are affecting water and other resources.

The BLM invasive species program has treated between 136 and 800 acres annually over the past decade. Energy companies treat approximately 70 to 200 acres annually for invasive plant species in addition to general vegetation treatments for fire hazards (BLM 2009a). On average,

the BLM annually treats 700 acres in Fremont County and 70 acres in Natrona County with herbicides (BLM 2009a).

There is a linear relationship with surface-disturbing activities and invasive species. Proper land rehabilitation practices can allow native vegetation to establish and out compete annual invasive plants in times of normal precipitation and if seedlings are protected from concentrated herbivory, which can otherwise lead to seedling mortality.

At present, WSAs, study exclosures, and most ACECs are almost free of invasive species. Roads and watercourses are the typical routes of invasive species invasion. The most invasive plant infested area is the Lander Slope ACEC and, secondarily, the riparian-wetland area of Beaver Creek. With well-established stands of leafy spurge, Russian knapweed, and hoary cress, the strategy is to contain these invasive plants at the perimeter of the infestation, typically through herbicides, and to introduce insect vectors in the infested areas. Gradually, since the early 1990s, the bulk of the introduced insects have been able to adapt or travel to suitable sites where they can survive, multiply, and diffuse to other infested areas. Some of the insects need a bit of help still and they are collected and placed where they are needed.

Before the 1990s, leafy spurge was largely a problem confined to the Lander Slope. Leafy spurge has since spread to ephemeral drainages to the Government Draw area and Beaver Creek. It can also be found sporadically along the Sweetwater River and in the Sweetwater Rocks in the Split Rock area. Horse Creek and Keester Basin in Natrona County have some isolated patches of leafy spurge, but they do not appear to be expanding. The introduction of *Aphthona* flea beetles has helped control some areas heavily infested by leafy spurge.

Russian knapweed has expanded its range in the planning area. This species occurs along Twin and Beaver Creeks and the wide floodplain of Badwater Creek and its tributaries in the northeastern part of Fremont County. It is also found in the ephemeral drainages between Poison Creek, by Moneta, to Lysite, Wyoming.

Spotted and diffuse knapweed are becoming more common along highways and in campgrounds. There is an infestation on the eastern part of Green Mountain in the Cooper Creek drainage that appears to be related to previous surface-disturbing activities.

Tamarisk, or salt cedar, has expanded its range in the past two decades to several small drainages north of Beaver Rim, including Big Sand Draw, and a dozen or more small reservoirs. There is also a tamarisk infestation at Carmody Lake, atop Beaver Rim.

One formerly prevalent invasive species of the Lander Slope was musk thistle. With the successful introduction of *Rhinocyllus conicus* and *Trichosirocalus horridus* weevils, this invasive species is no longer found in the dense thickets that used to exist roughly 25 years ago.

Cooperative Management for Invasive Plant Species

The Lander Field Office manages invasive plant species in accordance with the goals described in Partners Against Weeds, An Action Plan for the Bureau of Land Management (BLM 1996).

In 2007, the BLM established national priorities to be used in conjunction with local priorities for meeting restoration goals; these priorities are expected to improve efforts to prevent the spread of invasive species. The BLM established the following treatment priorities to promote integrated efforts across resource programs that manage vegetation.

- WUI protection treatments designed to reduce risk of wildland fire to the community and/or its infrastructure, developed collaboratively.
- Treatments to restore or maintain healthy, diverse, resilient, and productive native plant communities.
- Special status species habitat improvement projects designed to improve or protect special status fish, wildlife, and plant habitat.
- Treatments that are planned, implemented, and/or monitored using funding from multiple sources, both internal and external.
- Landscape treatments (more than 1,000 acres for mechanical and more than 4,500 acres for prescribed fires), coordinated across boundaries, to improve treatment effectiveness.
- The Federal Noxious Weed Act requires that the BLM enter into cooperative agreements with state agencies or local agencies to coordinate the management of invasive plant species or undesirable plants on BLM-administered lands. The BLM has agreements with Fremont County and the weed management areas.

In accordance with the above mentioned 2007 national priorities, development strategy to manage invasive plant species is set at the local level and aligned with land use planning objectives. Close cooperation with local community groups is a critical component of any effective strategy. Part of the analysis of proposed invasive species treatments includes determining what post-treatment management prescriptions need to be applied.

Vegetation treatment priorities identified in the Vegetation Treatment on BLM-Administered Lands in Thirteen Western States EIS (BLM 2007c) still apply to invasive plant species. More specific control priorities for current management include:

- Prevent infestation by use of certified weed-free hay, straw, seed, and reclamation material, along with vehicle washing and weed survey of areas proposed for surface-disturbing activities. Prevention is the first line of defense and the most cost-effective approach.
- Collaboration with other stakeholders is crucial. The BLM has been a cost-sharing sponsor of Fremont County Weed and Pest District coordinated efforts, such as periodic newspaper supplements about local weed control efforts and the printing of weed identification booklets distributed to the public. The Fremont County Weed and Pest District has also given presentations to the Lander Field Office personnel to increase weed knowledge and awareness.

Weed management areas, which are formed around areas with similar geography, weed infestations, climate, and human-use patterns, are tools to facilitate cooperation among all land managers and owners. The goal of weed management areas is to prevent the reproduction and spread of weeds into and within weed management areas. The formation of a weed management area replaces jurisdictional boundaries, which can be barriers to weed management programs, with natural boundaries that facilitate cooperation, coordination, and implementation of an integrated weed management program. One agency or landowner's weed management success is likely determined by the cooperative efforts of other landowners in the area.

At present, the Lander Field Office participates in the Popo Agie Weed Management Area and the Dubois-Crowheart Weed Management Area, and will soon be a cooperator in the newly formed Lower Wind River Weed Management Area. The Dubois area experiences extensive recreation

use and is a scenic area on a thoroughfare for Grand Teton and Yellowstone National Parks. The Dubois-Crowheart Weed Management Area was created to prevent new infestations of invasive species, educate the public about invasive species and the problems they cause, and to combat invasive species in this area.

The Fremont County Weed and Pest District plans, funds, and staffs a systematic invasive plant and pest inventory with the goal of examining all invasive plant susceptible lands at least every five years. Thus, about 20 percent of the land surface each year is searched for new infestations of plants and animals that are recognized as being injurious or damaging.

Cooperative Management for Pest Control

In February 2003, the USDA Animal and Plant Health Inspection Service (APHIS) and the BLM signed a MOU detailing cooperative efforts between the two entities on suppression of grasshoppers and Mormon crickets on BLM-administered lands (Appendix A (p. 1427)). This MOU clarifies that APHIS would prepare and issue to the public site-specific environmental documents that evaluate potential impacts associated with proposed measures to suppress economically damaging grasshopper and Mormon cricket populations. The MOU also states that these documents would be prepared under the APHIS NEPA implementing procedures with cooperation and input from the BLM. The MOU further states that the responsible BLM official would request in writing the inclusion of appropriate lands in the APHIS suppression project when treatment on BLM-administered lands is necessary. The BLM must also approve a Pesticide Use Proposal (Form FS-2100-2) for APHIS to treat infestations. According to the provisions of the MOU, APHIS could begin treatments after appropriate decision documents are issued and the BLM approves the Pesticide Use Proposal.

Wyoming designated pests (Table 3.34, “Wyoming Weed and Pest Control Act Designated List” (p. 382)) include grasshoppers, Mormon crickets, mountain pine beetle, beet leafhopper, prairie dogs, and ground squirrels. The preferred method for treating grasshoppers and Mormon crickets is by Reduced Agent Area Treatments (RAATs). RAATs is a grasshopper suppression method in which the rate of insecticide is reduced from conventional levels and treated swaths are alternated with swaths that are not directly treated. The RAATs strategy relies on the impacts of an insecticide to suppress grasshoppers in treated swaths while conserving grasshopper predators and parasites in swaths not directly treated.

Grasshoppers and Mormon crickets have not reached a level needing control for more than a decade. The local weed and pest districts and APHIS surveys determine the need for insect control. Because other agencies make decisions about how insects will be controlled on BLM-administered lands, this document does not further discuss invasive insect species.

Four aquatic pest species of concern in the planning area are the quagga mussel, zebra mussel, New Zealand mud snail, and didymo. The New Zealand mud snail has been found in the Bighorn Basin, an adjacent planning area. At present, the quagga mussel and zebra mussel are not found in the State of Wyoming, but they have been found in Colorado and Utah. Didymo algae is present in the planning area, but appears to be confined to a few streams, such as the Middle Fork of the Popo Agie River. Didymo algae could form massive blooms that could smother streambeds, affecting invertebrate species and ultimately fish populations.

Management Challenges for Invasive Species and Pest Management

Areas of disturbed soils and those subject to accelerated erosion are at an increased risk of invasive species establishment. These areas include sites with oil and gas activity such as pipeline construction in the Badwater Creek drainage, and AML projects such as large mine rehabilitation in the Gas Hills and Green Mountain areas. The Lower Wind River Weed Management Area was formed to combat the spread of invasive species due to mineral development activity in the Badwater Creek and Gas Hills areas.

Wildfires and the use of prescribed fire present challenges in managing invasive plant species. Some invasive plant species, such as cheatgrass, often spread and become established in burned areas. Managing burned areas to reduce the spread and establishment of invasive plants species requires BLM personnel and resources to develop and implement ES&R plans and perform monitoring and treatments.

The use of insects to manage invasive species presents a management challenge. Insects are often effective at treating invasive species; however, it is difficult to monitor their natural dispersal and effectiveness, especially when chemical, mechanical, or cultural (grazing) methods might also be occurring on the same site.

Confronting potential impacts of climate change is a management challenge for invasive species and pest management. Increasing levels of CO₂ and changing temperature and precipitation patterns could favor invasive species. Management of invasive species and pest management in response to climate change aids in addressing management challenges associated with changing science. Increased surface-disturbing activities and changing weather patterns, which could disproportionately favor invasive species, could present management challenges for invasive species. Refer to the *Climate Change* section at the end of this chapter for additional information.

3.4.4. Riparian-Wetland Resources

Riparian-wetland areas are the transition zones between terrestrial and aquatic ecosystems and are often the key sites in arid and semi-arid environments. These communities are found in areas along perennial or intermittent drainages, seeps, and springs, and make up a relatively small, but productive portion of the landscape. Wetlands are comprised of aquatic vegetation with unique soil characteristics that have developed under the influence of perennial water.

The BLM defines wetlands as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that normally supports, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Riparian-wetland areas include marshes, shallow swamps, lakeshores, bogs, and wet meadows, along with lands adjacent to or contiguous with perennial and intermittent flowing rivers and streams, lakes, and reservoirs with stable water levels. Ephemeral streams that do not exhibit the presence of vegetation that depends on free water in the soil are usually not considered riparian-wetland areas.

Healthy riparian-wetland areas enhance water quality, control erosion, diminish the impact of floods, and act as a stabilizing force during drought. These areas provide biological diversity; stable banks and shorelines; floodplain maintenance; clean and stable water supplies; aquifer recharge; flood energy dissipation and moderation; fish and wildlife habitat; livestock forage; opportunities for recreation; carbon sequestration; and scenery.

Riparian-wetland communities also support a number of BLM sensitive species. In addition, Ute ladies'-tresses is an endangered plant species only found in riparian-wetland areas.

The importance of greater sage-grouse, both as a BLM sensitive species and as identified by the Governor's Task Force, is receiving national attention. Riparian-wetland areas are a component of brood-rearing habitat for greater sage-grouse because they provide needed forbs and insects necessary for chick survival.

The BLM riparian-wetland initiative for the 1990s set goals for public land riparian-wetland areas. These included restoring and maintaining riparian-wetland areas so that at least 75 percent are in PFC by 1997; protecting riparian-wetland areas and associated uplands through proper land management; and by avoiding or mitigating adverse impacts.

Riparian-wetland communities make up less than 3 percent of the BLM-administered surface in the planning area, but their value is inversely proportional to their physical extent. Some rangeland studies have found that even though riparian-wetland meadows and stream corridors cover only 1 to 2 percent of a given pasture, they often supply 20 percent of the forage produced; in steeply sloping pastures they can account for more than 80 percent of the herbaceous forage removed by cattle. These areas also benefit wildlife; some have called riparian-wetland stream corridors the single most productive type of habitat on the land (Kauffman et al. 1984). The influence of riparian-wetland ecosystems to wildlife is not limited to animal species restricted in distribution to streamside habitat, but also is important to elk, mule deer, pronghorn, greater sage-grouse, blue and ruffed grouse, nongame species, and insects.

Riparian-wetland areas are important to wildlife migrants and to a diverse population of seasonal residents. Most terrestrial animal and insect life depends on riparian-wetlands or wetland areas as sources of water, forage, and cover. It is estimated that 70 to 85 percent of Wyoming's wildlife uses riparian-wetland areas for at least a portion of their life-cycles (BLM 2009a).

There are a number of indicators to evaluate the condition of riparian-wetland areas, including plant composition and diversity; bank stability; channel morphology and floodplain function; erosion and water infiltration rates; groundcover; and the chemical, physical, and biological characteristics of the water. To meet Standard 2 of the Wyoming Standards for Healthy Rangelands, riparian-wetland communities should have structural, age, and species diversity characteristic of the stage of channel succession and be resilient and capable of recovering from natural and human disturbance in order to provide forage and cover, capture sediment, dissipate energy, and provide for groundwater recharge. Indicators used to assess Standard 2 include erosion and deposition rate, channel morphology and floodplain function, channel succession and erosion cycle, vegetative cover, plant composition and diversity, bank stability, woody debris and in stream cover, and bare ground and litter. Refer to the *Livestock Grazing Management* section of this chapter for additional information on the Wyoming Standards for Healthy Rangelands.

Riparian-wetland Communities

Forest Dominated Riparian-Wetlands

Cottonwood is the most common riparian-wetlands tree species, but aspen, boxelder, and a variety of conifer species are also present in the planning area (BLM 2009a). Cottonwood regeneration depends on the presence of bare, moist soil for seedling germination, so stands tend to occur on ephemeral systems or perennial systems where the channel is braided. Cottonwood stands are invariably the product of systems that feature highly variable streamflows that periodically scour

potential germination sites, and move the stream channel laterally across the floodplain. The introduced species of salt cedar (tamarisk) is starting to show up in many riparian-wetland zones that formerly featured willows and cottonwoods.

Shrub Dominated Riparian-Wetlands

Systems with persistent water availability and moderate gradients generally form shrub dominated riparian-wetland areas. Several species of willow are the main shrub component of riparian-wetland zones, but other species such as water birch and alder are common.

Herbaceous Dominated Riparian-Wetlands

Herbaceous dominated communities represent the largest percent of riparian-wetland areas in the planning area. Wetlands and riparian-wetland areas with low gradients are typically dominated by grasses, sedges, rushes, bulrushes, and forbs. Herbaceous dominated riparian-wetland areas typically do not include woody species, but are dominated by herbaceous wet meadow complexes that are grazed by wildlife. The presence of wet meadow areas within this community can result in hummocking which may be interpreted as an indication of riparian-wetland degradation.

Proper Functioning Condition Assessment

PFC is the assessment tool used to determine the relative health of stream hydrology, riparian-wetlands vegetation, and the aquatic fauna and flora of riparian habitats. A wetland system that exhibits high integrity and proper function has a mosaic of well-connected, high-quality water and habitats that support a wide assemblage of native species and the genetic diversity necessary for long-term persistence and adaptation in a variable environment. The BLM utilizes PFC as a tool to measure riparian-wetlands as required by Standard 2 of the Wyoming Standards for Healthy Rangelands.

Most lotic (moving water) and lentic (standing water) riparian-wetland habitats (Map 48) were assessed for PFC between 1994 and 2002 (BLM 1993b). PFC assessments still need to be completed on approximately 91 acres and 51 miles of riparian-wetland habitats. Table 3.36, “Results of Proper Functioning Condition Assessment Ratings” (p. 389) lists the PFC assessment ratings for lotic and lentic areas on BLM-administered surface in the planning area.

Table 3.36. Results of Proper Functioning Condition Assessment Ratings

Condition	Lotic Miles	Lentic Acres
Proper Functioning Condition	104	1,259
Functional at-Risk Upward Trend	37	109
Functional at-Risk Not Apparent Trend	96	202
Functional at-Risk Downward Trend	96	1,298
Non-Functional	33	195
Unknown	51	91
Total	417	3,154

Source: BLM 2009a

PFC is the minimum acceptable condition for public land riparian-wetlands, and approximately 25 percent of assessed lotic miles and 40 percent of lentic acres met this standard at the time of the evaluations. Most of these areas have not been formally reassessed to determine the impacts

of the multi-year drought, although site visits and monitoring have shown a continued declining trend on some riparian-wetland areas.

The presence or absence of wetland, sub-irrigated, and lowland sites in their proper place in the landscape is often an indicator and product of riparian-wetland health. When a riparian-wetland area is in a downward trend, the water table drops and the site dries out. Vegetation common to a lowland site would encroach on the adjacent sub-irrigated site. Poor road design, water diversions, and herbivory have been identified as factors affecting the condition of riparian-wetland areas.

Livestock prefer riparian-wetland zones during the hot summer season which can lead to increased concentration and heavy, repeated, utilization if improperly managed. Such grazing results in a shift from deep rooted sedges that armor stream banks to shallow rooted bluegrasses that do not armor stream banks is an issue. This shift pre-stages a change in stream channel morphology, where wider or deeper watercourses that drain the watershed are created.

When riparian-wetland areas that feature cottonwood stands are not functional, adult trees persist, but reproduction tends to fail. Cottonwood seedlings are not usually palatable, but tend to be browsed because of their position in the landscape. Cottonwood galleries become remnant galleries, and eventually the stand is lost as the existing trees die out.

On shrub dominated systems, upland species such as big sagebrush encroach on the lowland site. Herbaceous species on the sub-irrigated site shift from preferred species such as sedges and tufted hairgrass to a less valuable, but grazing resistant mix dominated by bluegrasses, dandelion, cinquefoil, and pussytoes. Older willows take on a mushroomed appearance and reproduction is unsuccessful. The wetland site narrows, and eventually the grazing-resistant mix that formed on the sub-irrigated site replaces the sedges.

On herbaceous dominated sites, the progression is much the same as described for shrub dominated sites, except no shrubs are involved in the transition. The wetland site also tends to undergo hummocking as it transitions to the lowland site.

Hummocked areas feature an uneven soil surface where steep sided mounds approximately 1 square foot in size dominate the site. Hummocked areas tend to be in low gradient lentic sites not armored by bedrock, although it is not uncommon to find them in streamside riparian-wetland zones. Some dispute the origin of hummocks, but their presence is correlated with repeated concentration of cattle in the summer (BLM 2009a). The creation of hummocks leads to a shift in plant composition; the top of the hummocks is drier than the interspaces. Wetland plants are replaced with upland species on the tops of hummocks. Capillary action from seasonal wetting brings salts to the surface, which has led to the formation of alkali deposits, or soil salinization, in some areas. Soil compaction and root shearing, caused by hoof action in the interspaces between hummocks, accelerates erosion. As wetlands dry, they are more vulnerable to erosion by wind and water. Wetlands with severe hummock formation do not produce riparian-wetland values commensurate with their potential.

Lowland sites dominated by basin big sagebrush and great basin wild rye are generally not evaluated in a PFC format because they make limited contributions to riparian-wetland features. However, when these sites are not functional the herbaceous component is primarily annual mustards. In recent years, cheatgrass has become a concern in these locations.

The primary reasons certain riparian-wetland areas were not assessed to be in PFC include vegetation shifts from riparian-wetland plants to upland species; poor vegetative composition and

diversity; wide and shallow channels; headcuts and excessive erosion; unstable banks; narrowing of floodplains; and excessive hummocking.

Some streams that historically supported beaver populations have no existing beaver activity due to a loss of adequate amounts of woody plants and appropriate dam building material, and erosion caused by surface-disturbing activities. Beaver were crucial to maintaining the dam and pond complexes on small streams throughout the planning area; however, they are largely absent from these former habitats. Without beaver to maintain them, the old dams have washed out, water tables have dropped, and streams have become entrenched. These degraded ecosystems function as drainage ditches rather than wetlands and associated riparian-wetland zones that formerly stored water and served to spread and dissipate the energy of floods.

The PFC assessments indicate that many riparian-wetlands (23 percent of lotic miles and 41 percent of lentic acres) are in a downward trend. This downward trend has been impacted by the drought the planning area has experienced since 2000. Drought has affected vegetation production and water availability in riparian-wetland areas. Springs that depend on rainfall to recharge their aquifers have experienced decreased flows in recent years. Stream reaches in some areas have become dry or almost dry during late summer and fall due to lack of snow runoff and below-average precipitation.

A variety of methods have been implemented to improve conditions, including the implementation of grazing systems, installation of additional range improvement projects, stubble height monitoring, the repair of roads and stream crossings, and vegetative treatments.

Management Challenges for Riparian-Wetland Resources

Livestock grazing in riparian-wetland areas creates management challenges. Intensive use of riparian-wetland areas by livestock, as well as wildlife and wild horses, can degrade the condition of riparian-wetland areas and prevent areas from meeting the rangeland health standards. As management moves toward meeting the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)) and improving the reclamation success of surface-disturbing activities, the upward trend established in some intensely managed grazing allotments could be extended. Rangeland health assessments completed thus far indicate that allotments not meeting health standards often fail due to the condition of riparian-wetland habitats (Standard 2).

In general, riparian-wetland areas where intensive management of livestock grazing has been implemented are improving. Intensive management typically includes changing the time of year for livestock use, reducing the amount of time the areas are used, creating fenced riparian-wetland pastures and exclosures, and developing range improvements such as offsite water and forage through vegetative treatments.

Fencing riparian-wetland areas into exclosures and eliminating grazing, having very limited grazing use, and prescribed grazing practices that incorporate rest and deferment into grazing systems has improved riparian-wetland conditions in places, although fencing can result in adverse impacts to wildlife, wild horses, recreation, and visual resources. The success of exclosure fencing on riparian-wetland health suggests that the number of riparian-wetland exclosures and pastures could increase to address certain management challenges. Riparian-wetland pastures have been successful in improving conditions, but the speed of improvement appears to depend on the length of time grazing is allowed within the pasture. Management is complicated by the fact that the BLM often controls only small segments along stream courses, with most of the stream under other ownership.

Discharge of produced water can pose a management challenge associated with riparian-wetland health, especially if the discharged water is high in salt or other dissolved solids, which reduces water quality. However, there are locations where surface discharge of produced water can beneficially impact a riparian-wetland area, depending on volume, water quality, topography, vegetation, and other factors. Water discharged down an existing vegetation drainage, at a volume that the drainage can accommodate, can beneficially impact the stream by supporting vegetation and in other ways.

Development in the planning area has the potential to degrade riparian-wetland areas and create management challenges. Mineral extraction requires new roads and other surface disturbance, all of which have the potential to affect riparian-wetland areas. Although surface disturbance must be kept 500 feet away from riparian-wetland areas, erosion from the disturbed soil still could degrade them. The increase in surface disturbance from these permitted activities, and the potential for additional mineral development and major ROW activities, continues to adversely impact riparian-wetland areas throughout the planning area.

Motorized vehicle use in the planning area has also affected riparian-wetland conditions. When use occurs off existing trails, it creates new surface disturbances and the resulting erosion causes silt infiltration of riparian-wetlands. Motorized cross-country users can create large disturbance areas trying to avoid muddy areas. This outcome has been observed in a number of places during the wet spring period or where motorized hunting occurs after snowfall. Motorized vehicle use on stream banks can result in banks breaking down and additional sediment being added to the drainage.

Fish and Wildlife Resources

The BLM is responsible for managing fish and wildlife habitat on BLM-administered land in the planning area. Management of fish and wildlife species is overseen by state and federal wildlife management agencies. The WGFD manages resident wildlife populations in the planning area. The USFWS provides regulatory oversight for all species listed, proposed for listing, or candidates for listing under the ESA. The USFWS also administers the Migratory Bird Treaty Act (MBTA), which protects migratory bird species whether they are hunted (waterfowl) or not (songbirds). For a description of special status species, see the *Special Status Species – Fish* and *Special Status Species – Wildlife* sections.

3.4.5. Fish and Wildlife Resources – Fish

Fish habitats are managed according to laws, regulations, BLM policies, and principles of fish management within the BLM multiple-use mandate. Aquatic species, to the extent that they are directly managed, are overseen by state and federal game management agencies. The WGFD is responsible for regulating the sport and commercial take of all fish in the planning area. The USFWS has oversight over federally threatened or endangered species. However, the BLM directly manages the habitat that supports both game and nongame fish species where they are found on BLM-administered lands. See the *Special Status Species – Fish* section for a discussion of threatened, endangered, and BLM-designated sensitive fish species such as the Yellowstone cutthroat trout.

Fish species known to occur in the planning area are adapted to a variety of stream habitats, from cold, rapid waters at higher elevations to slow, turbid waters of the high desert. Most fish populations occur in the larger rivers and their tributaries, although the WGFD stocks several

waterbodies. Fish are typically classified as game or nongame and native or nonnative species. Table 3.37, “Fish Species Known to Occur in the Planning Area” (p. 393) identifies fish species known to occur in the planning area.

Table 3.37. Fish Species Known to Occur in the Planning Area

Common Name	
Burbot	Longnose Dace
Brook Trout	Longnose Sucker
Black Bullhead	Mottled Sculpin
Black Crappie	Mountain Sucker
Bluegill	Mountain Whitefish
Brown Trout	Shorthead Redhorse
Bonneville Cutthroat Trout	Plains Killifish
Channel Catfish	Rainbow Trout
Creek Chub	River Carpsucker
Carp	Sauger
Emerald Shiner	Sand Shiner
Flathead Chub	Splake
Fathead Minnow	Snake River Cutthroat Trout
Green Sunfish - Bluegill Hybrid	Stonecat
Golden Shiner	Spottail Shiner
Iowa Darter	Walleye
Johnny Darter	White Crappie
Lake Trout	White Sucker
Lake Chub	Yellow Perch
Largemouth Bass	Yellowstone Cutthroat Trout

Source: BLM 2009a

The Big Horn and North Platte watersheds are the two major drainages in the planning area (Map 4). Fish habitat includes perennial and intermittent streams, lakes, and reservoirs that support fish through at least part of the year (Map 49). The condition of fish habitat is related to the hydrologic conditions of the upland and riparian-wetland areas associated with or contributing to a specific stream or waterbody. Aquatic habitat quality varies by location and orientation to geographic landforms and vegetation. Stream habitat conditions are closely tied to riparian-wetland conditions and water quality. Riparian-wetland vegetation moderates water temperatures, increases bank stability, supports insects used as important food sources, filters sediment, provides in stream habitat for fish, and provides organic material for aquatic insects (see the *Riparian-Wetland Resources* section). Point source discharge, which is managed by the State of Wyoming, also has implications to fish and aquatic life. The listing of a waterbody as impaired under the Clean Water Act raises concerns for potential impacts to fish and aquatic life. Refer to the *Water* section in this chapter for information regarding water quality.

The WGFD estimates that approximately 367 miles of the 775 miles of streams that occur on BLM-administered lands support fish. The remaining stream miles either are unsuitable for fish or only support fish seasonally when conditions are suitable. The WGFD manages most of these streams for brook, brown, cutthroat, and rainbow trout species. However, there is some focus on managing several streams for native species.

Cold-water sport fisheries are dominated by trout; cool-water sport fisheries contain burbot, sauger, and walleye. The WGFD classifies cold-water sport fisheries into ribbon categories based on estimated pounds of sport fish per mile. These categories, ranging from high to low, are blue, red, yellow, or green for streams containing cold-water sport fisheries and orange for streams

containing populations of cool/warm sport fish species. Of the BLM-administered stream miles that support cold-water populations, less than 1 mile in the planning area is categorized as blue ribbon; 6 miles are red ribbon; 54 miles are yellow ribbon; and 138 miles are green ribbon.

In general, cold- and cool-water sport fisheries are in decline and populations of nongame fish range from stable to declining. The Sweetwater River in Sweetwater Canyon is the highest quality fishery in the planning area. This stretch of river supports a cold-water fishery that includes brown, rainbow, brook, and cutthroat trout species and has approximately 10 miles of contiguous habitat on public land; such a stretch is rare in the planning area. This area provides excellent fishing opportunities and is a popular destination for recreationists. This stream section also has an in streamflow protection for fish and a Wyoming DEQ Class 1 water designation; such a designation is uncommon outside wilderness areas.

The Sweetwater River and its tributaries provide spawning habitat for native and nonnative fish. Most identified spawning areas are for trout species because they are the easiest to detect. Spawning areas for native nongame fish communities are largely undetermined. There are very few streams with contiguous miles of fisheries on public lands; most stream miles are on private lands, with segments on BLM-administered lands. The premier stream sections on public lands are in the Sweetwater Canyon stretch of the Sweetwater River.

There are three segments of rivers that have in streamflow protections for fish. These include 10.2 miles on the Sweetwater River below Wilson Bar, 5.2 miles on the Wind River below its confluence with Jakey's Fork, and 1.4 miles below the canyon on the Little Popo Agie River. The Wind River and Little Popo Agie River segments do not cross BLM-administered lands; however, approximately 9.8 miles of the Sweetwater River segment is on BLM-administered lands.

There are several reservoirs on BLM-administered lands capable of supporting a fishery; the WGFD stocks many of these reservoirs with game fish. Some reservoirs have been dry for a number of years and many have low and fluctuating water levels.

The WGFD stocks and manages Silver Creek and Western Nuclear Reservoirs for rainbow and brook trout and Antelope Springs and Jensen Reservoirs for rainbow trout. The WGFD has stocked Picket Lake with several species of fish in an attempt to find one that would thrive; at present the WGFD manages Picket Lake for yellow perch. Carmody Lake is a playa that relies on snowmelt and has been dry for several years. When there is enough water to sustain a population for a year, the WGFD stocks Carmody Lake with rainbow trout. Historically, the WGFD has stocked and managed Snyder Creek Reservoir for rainbow trout; however, due to drought and the abandonment of the irrigation ditch that fed the reservoir, it has ceased to function as a fishery. The WGFD manages Spring Creek Reservoir for rainbow and brook trout, but due to low water, this reservoir has not been stocked in recent years. The WGFD used to manage Rocky Draw Reservoir for brook trout, but the reservoir has not had water in it for approximately 15 years. These reservoir fisheries do not have specific management prescriptions other than the 500-foot setback from riparian-wetland areas for permitted surface-disturbing activities.

Sauger and burbot are WGFD species of concern and are found in the planning area. Actions affecting water quality and quantity for waters in which these species occur and upstream tributaries could adversely impact spawning success and the survival of early life stages for these species. Early life stages are sensitive to environmental conditions and decreasing turbidity during spring could lead to increased predation of larval fish. These species are discussed in the *Special Status Species-Fish* section of this document.

Management Challenges for Fish

Management challenges for fish include sediment loading, drought conditions, water depletions, isolated systems, aquatic invasive species, and activities that degrade riparian-wetland areas. In addition, the BLM manages relatively little fish habitat and very few streams have contiguous miles of fish habitat on public lands in the planning area. Surface-disturbing activities can contribute sediment to spawning areas and can alter stream hydrology and degrade the stream or its water quality, which could adversely impact fish habitat, reproduction, and survival. Changes in weather patterns (e.g., drought) could contribute to changes in stream systems such as flow, temperature, and turbidity. Due to drought conditions and increased demands for water on private lands, sections of secondary streams and tributaries of primary rivers can become almost dry during late summer and early fall; which directly affects river fisheries habitat. Aquatic invasive species (e.g., zebra mussels) degrade fish habitat (see the *Invasive Species and Pest Management* section) and create management challenges to control their spread and establishment. Continuation of activities that degrade riparian-wetland areas could result in further declines in fish communities and shift streams from cold-water to cool- and warm-water fish communities dominated by nongame fish species. Irregular land ownership patterns and the inability to influence water diversions and in-streamflows limit opportunities for fish habitat improvements on BLM-administered lands.

3.4.6. Fish and Wildlife Resources – Wildlife

Wildlife resources include big game, trophy game, furbearers, predators, small game, game birds, migratory game birds, and nongame species (raptors, mammals, neotropical migrant birds, reptiles, and amphibians), and their habitats. The BLM is responsible for managing wildlife habitats, whereas management of wildlife species is overseen by state and federal wildlife management agencies. This section includes a description of the existing conditions and management challenges for habitat types and statutory wildlife groups in the planning area. See the *Special Status Species – Wildlife* section for a discussion of threatened, endangered, and BLM-designated sensitive wildlife species.

The health and viability of different types of wildlife and their habitats are connected. Though each category of wildlife is described independently in this section, these species and groups of wildlife are inherently linked by the habitat they share and the synergistic connections in ecosystem function. As a result, management that affects one species may also result in unanticipated impacts to other species.

Wildlife populations require healthy and connected habitats. Some wildlife species migrate seasonally, some species use large territories to hunt, and other species travel great distances to maintain genetic diversity in their populations. Habitat connectivity is important for wildlife to obtain food, water, and cover, for migration, and for reproduction. Each habitat type supports an assemblage of species. Wildlife species have unique inter-relationships, which link assemblages on a landscape to one another and to specific habitats within the landscape.

The wildlife section is not intended to be an encyclopedic description of all wildlife species that occur in the planning area, instead it focuses on the habitat types that occur in the planning area and the wildlife species that are typically associated with those habitat types. Some of the species may use other habitats during certain portions of year or during their life-cycles. In addition, the descriptions of the habitats for one species may apply to other species not identified. Emphasis is placed on species that are of particular interest to the public for hunting, watching, or

photography, as well as species or groups of species that serve as indicators of ecosystem health or management activities.

Wildlife and Habitats in the Planning Area

There are diverse wildlife habitats in the planning area, primarily because of its location in the Southern Rocky Mountain and the Intermountain Semidesert ecoregions (Bailey 1995). Elevation in the planning area ranges from 4,750 feet to 10,400 feet, which supports a variety of habitats including coniferous forests, juniper woodlands, aspen stands, mountain shrublands, canyons and rim rock, badlands, sagebrush-steppe shrublands, grasslands, and riparian-wetland areas. This variety of habitats possesses the biological and physical attributes important for breeding, birthing, foraging, wintering, and migrating wildlife species. The habitats and wildlife in the planning area represent the Great Basin flora and fauna. For more detailed information on vegetation in the planning area, please refer to the *Vegetation – Forests, Woodlands, and Aspen Communities*, *Vegetation – Grassland and Shrubland Communities*, and *Riparian-Wetland Resources* sections of this chapter.

Grasslands, sagebrush, and mountain shrub vegetative types dominate the planning area (Table 3.33, “Acreage of Vegetative Communities in the Planning Area” (p. 373)). The open grassland, sagebrush, and shrubland vegetative types are home to many raptor species, including the Swainson’s hawk, northern harrier, and prairie falcon. These vegetative types support many other wildlife species, including small game, upland game birds, and numerous rodent species upon which raptors prey. Sagebrush provides crucial winter range for big game and habitat necessary for greater sage-grouse and other sagebrush obligate species such as the Brewer’s sparrow, sage sparrow, and sage thrasher.

Riparian-wetland communities make up less than 3 percent of the BLM-administered lands in the planning area, but these areas support the greatest diversity of plant and animal life of all habitat types. Riparian-wetland communities provide forage and cover for moose, furbearers, neotropical migrants, and amphibians, as well as corridors for wildlife migration and travel.

In the planning area, forests and woodlands are limited and are dominated by lodgepole pine, Douglas-fir, limber pine, Rocky Mountain and Utah juniper, aspen, and cottonwood. Although these areas are less abundant than grasslands and shrublands, they add structural and biological diversity to the landscape. Forests and woodlands provide cover for big game and are habitats for mountain lion, black bear, dusky grouse, marten, and northern goshawks.

The condition of wildlife habitat is related to management that impacts vegetation and habitat connectivity. Habitat quality varies in the planning area, with areas that do not meet PFC or the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)) generally being less supportive of wildlife. Management that has occurred in the planning area to maintain or improve habitat for wildlife includes vegetation treatments, restrictions on surface-disturbing activities, application of mitigation measures and BMPs, fire and fuels management, limitations on motorized vehicle use, and management of livestock grazing.

There are several important features and areas in the planning area that provide habitat and survival of wildlife, including birthing and winter range habitats for big game, riparian-wetland habitats, and the Whiskey Mountain bighorn sheep area. In addition, habitat integrity, unfragmented habitat, and migration routes are important to wildlife in the planning area. Birthing and winter range habitats are typically used each year and are usually limited in size and availability. The East Fork elk winter range north of Dubois supports as many as 6,000 to

7,000 elk without the need for supplemental feeding. The Lander Slope and Red Canyon areas provide the necessary winter forage for elk and mule deer that is not available on adjacent areas due to deep snows. Green and Crooks Mountains provide year-round habitat for a predominantly non-migratory elk herd. Elk primarily summer on top and on the south slopes, and are fairly restricted to the north slopes during winter months because of snow depths. There are designated calving areas on top of Green Mountain.

Many species of wildlife depend on healthy riparian-wetland habitats to provide for their necessary forage and cover requirements. The year-round availability of clean water is essential for maintaining wildlife and fish populations. Compared to all other habitats, these areas support the greatest diversity of wildlife and plant species. Many species of birds, amphibians, reptiles, and mammals are found only in riparian-wetland habitats. Riparian-wetland areas in the South Pass, Upper Beaver Creek, and Sweetwater River Valley are important moose habitat.

The Whiskey Mountain bighorn sheep area near Dubois supports one of the largest and most visible bighorn sheep herds in North America. BLM-administered lands provide crucial winter range for bighorn sheep in this area (Map 50). The only active habitat management plan in the planning area, *A Comprehensive Bighorn Sheep Management Plan* (Bighorn Sheep Technical Committee 2006), guides the management responsibilities for the Whiskey Mountain Bighorn Sheep Winter Range to perpetuate and emphasize bighorn sheep and their habitat (Map 55).

The WGFD developed a conservation strategy, *A Comprehensive Wildlife Conservation Strategy for Wyoming* (WGFD 2005), to provide a long-range conservation plan to conserve Wyoming's Species of Greatest Conservation Need and meet the requirements of the Congressionally authorized State Wildlife Grants Program. The BLM was a partner in this effort. The species and habitats identified in the conservation strategy, along with the associated challenges and conservation actions, define the focus of cooperative efforts to conserve and manage Wyoming's wildlife.

Terrestrial vertebrate wildlife species in the planning area represent all major vertebrate classes: mammals, birds, reptiles, and amphibians. Terrestrial wildlife species are described below under the WGFD statutory wildlife categories of big game, trophy game, furbearing animals, predatory animals, small game, game birds, migratory game birds, and nongame species (raptors, neotropical migrants, mammals, and reptiles, and amphibians). Refer to the *Special Status Species – Wildlife* section for information on wildlife species of special concern (threatened, endangered, and sensitive species).

Big Game

Big game species include pronghorn, mule deer, white-tailed deer, elk, moose, and bighorn sheep. Much of the planning area is big game habitat and because the BLM manages much of this habitat, the BLM regularly consults with the WGFD, which manages the populations. The WGFD big game herd management objectives are based on herd units. Boundaries of the herd unit areas are established to encompass all of the seasonal ranges and habitats or special life function areas (such as calving and lambing) utilized by a more or less discreet population or herd. Table 3.38, "Big Game Herd Units, Acreage, and Population Estimates in the Planning Area" (p. 398) provides information on the herd units and big game populations in the planning area.

Table 3.38. Big Game Herd Units, Acreage, and Population Estimates in the Planning Area

Herd Unit Name	Total Herd Unit Acres	Herd Unit Acres in Lander Field Office	Percent of Herd Unit in Lander Field Office	Herd Unit acres on BLM-administered Land	Percent of Herd Unit on BLM-administered Land	Herd Unit Population Objective	Herd Unit Population 2005	Herd Unit Population 2007
Pronghorn								
Badwater	648,299	407,181	63	269,915	42	3,000	3,900	3,645
Beaver Rim	2,618,700	2,422,184	92	1,590,126	61	25,000	25,900	24,504
Copper Mountain	1,458,546	14,155	1	5,419	1	4,800	5,000	5,152
North Ferris	328,978	21,968	7	10,478	3	5,000	4,800	5,200
Project	1,949,591	1,949,292	100	258	< 1	400	308	288
Rattlesnake	630,441	37,149	6	21,504	3	12,000	Unknown	Unknown
Red Desert	2,181,405	469,685	22	411,393	19	15,000	12,400	13,200
Sublette	6,850,689	87,467	1	29,080	1	48,000	49,100	62,200
Wind River	796,952	790,994	99	36,781	5	400	Unknown	627
Total	-	6,200,075	-	2,374,954	-	-	-	-
Mule Deer								
Beaver Rim	831,894	712,714	86	547,696	66	2,600	900	1,150
Chain Lakes	699,791	22,731	3	22,089	3	500	500	480
Dubois	1,232,962	791,750	64	36,833	3	10,000	7,900	7,085
Ferris	783,489	21,965	3	10,479	1	5,000	2,700	3,288
Project	1,953,011	1,952,714	100	81	< 1	500	402	480
Rattlesnake	825,740	152,671	18	107,716	13	5,500	4,700	4,540
Southwest Bighorns	1,953,173	420,324	22	275,320	14	28,000	25,900	26,455
South Wind River	1,238,837	1,085,162	88	575,338	46	13,000	10,200	10,267
Steamboat	2,562,699	29,234	1	27,714	1	4,000	4,000	4,520*
Sublette	3,901,897	27,281	1	0	0	32,000	28,900	31,241
Sweetwater	1,015,088	987,151	97	771,693	76	6,000	5,800	5,643
Total	-	6,203,697	-	2,374,959	-	-	-	-
White-tailed Deer								
Bighorn Basin	8,177,677	277,852	3	5,516	0	No Objective	Unknown	Unknown
Central	9,230,982	152,671	2	107,716	1	No Objective	Unknown	Unknown
Total	-	430,523	-	113,232	-	-	-	-
Elk								
Ferris	797,724	21,991	3	10,489	1	350	500	510
Green Mountain	1,774,154	1,627,184	92	1,252,837	71	500	1,300*	Unknown
Jackson	1,119,001	24,148	2	0	0	11,000	12,500	12,881
Rattlesnake	810,866	152,564	19	107,660	13	200	Unknown	Unknown
Shamrock	699,943	22,762	3	22,119	3	75	130	120
South Bighorn	3,251,163	406,015	12	273,021	8	2,900	3,300	5,450
South Wind River	1,519,564	985,502	65	484,405	32	3,300	4,000	3,696
Steamboat	2,529,713	201,885	8	185,251	7	1,200	1,250	1,300
Green River	530,153	3,055	1	0	0	2,500	2,300	2,452
Wiggins Fork	2,771,646	2,765,470	100	36,924	1	6,000	6,000*	5,974

Herd Unit Name	Total Herd Unit Acres	Herd Unit Acres in Lander Field Office	Percent of Herd Unit in Lander Field Office	Herd Unit acres on BLM-administered Land	Percent of Herd Unit on BLM-administered Land	Herd Unit Population Objective	Herd Unit Population 2005	Herd Unit Population 2007
Total	-	6,210,576	-	2,372,706	-	-	-	-
Moose								
Dubois	798,105	792,204	99	36,832	5	400	Unknown	Unknown
Jackson	962,708	23,975	2	0	0	3,600	1,500	1,691
Lander	2,712,810	2,095,132	77	1,367,605	50	450	327	315
Sublette	3,717,236	3,239	0	0	0	5,500	4,000	4,629
Total	-	2,914,550	-	1,404,437	-	-	-	-
Bighorn Sheep								
Franc's Peak	1,797,318	494,160	27	17,003	1	1,360	1,400	1,386
Jackson	1,065,568	23,940	2	0	0	500	400	406
Temple Peak	770,471	511,807	66	40,040	5	250		40
Whiskey Mountain	898,151	347,238	39	8,290	1	1,350	650	681
Yount's Peak	849,174	172,297	20	53	0	900	900	923
Total	-	1,549,442	-	65,386	-	-	-	-
Source: BLM 2009a; BLM 2012a								
Note: Acreage totals may be different than other totals depicted throughout the document as a slightly different ownership layer was used to calculate the acreage.								
< less than								
BLM Bureau of Land Management								

The planning area contains 1,055,702 acres of crucial winter range for big game, of which 605,898 acres are on BLM-administered surface. Winter is a stressful time for wild ungulates; therefore, crucial winter range is often the focus of management for big game populations. During winter months, snow depths, forage availability, and cold temperatures stress big game populations. Snow depths can impede the movement of big game and forage is limited and may be lacking nutritional elements needed by these species. These elements plus the cold temperatures cause winter to be stressful for big game and can lead to starvation. Winter ranges typically provide more food and cover during the winter months. In addition to crucial winter range, the planning area provides summer ranges and parturition areas for big game. Summer ranges provide thermal and visual cover and adequate forage, particularly for females with young. Parturition areas are important for reproductive success and this habitat is limited in the planning area. Table 3.39, "Acres of Big Game Seasonal Habitats on BLM-Administered Surface in the Planning Area" (p. 399) identifies big game seasonal habitats in the planning area. Maps 55–59 and Map 61 identify the WGFD herd units for pronghorn, mule deer, white-tailed deer, elk, moose, and bighorn sheep, respectively.

Table 3.39. Acres of Big Game Seasonal Habitats on BLM-Administered Surface in the Planning Area

Seasonal Range	Pronghorn	Mule Deer	White-tailed Deer	Elk	Moose	Bighorn Sheep
Spring/ Summer/Fall	560,593	236,489	-	62,663	101,739	22,176
Yearlong	496,348	545,944	-	92,384	11,270	-
Winter/ Yearlong	906,318	427,070	-	102,541	13,200	5,704

Seasonal Range	Pronghorn	Mule Deer	White-tailed Deer	Elk	Moose	Bighorn Sheep
Winter	-	843	-	48,196	17,759	-
Crucial Winter/Yearlong	351,178	200,407	-	38,355	38,100	9,151
Crucial Winter	-	-	-	28,570	5,429	-
OUT ¹	59,699	963,372	114,413	1,986,068	1,214,563	38,235
Severe Winter Relief	-	-	-	13,092	-	-
No Herd Unit	-	-	2,259,725	2,262	972,072	2,298,866
Parturition Areas ²	-	-	-	22,708	-	4,803
	-	-	-	-	-	-
Total BLM Acres	2,374,136	2,374,125	2,374,138	2,374,131	2,374,132	2,374,132
Sources: BLM 2009a; BLM 2012a						
¹ These areas do not contain enough animals to be important or the habitats are of limited importance to the species.						
² Parturition areas overlap other seasonal ranges.						
Note: Acreage totals may be different than other totals depicted throughout the document as a slightly different ownership layer was used to calculate the acreage.						
BLM Bureau of Land Management						

Several diseases, including chronic wasting disease, epizootic hemorrhagic disease, and pneumonia, are known to affect big game species, although none of these diseases is prevalent in the planning area. Chronic wasting disease is a contagious neurological disease affecting deer, elk, and moose. It causes a degeneration of the brain of the infected animal and results in emaciation, abnormal behavior, loss of bodily functions, and death. Epizootic hemorrhagic disease causes spontaneous hemorrhaging in the muscles and organs and results in death. Pneumonia, a respiratory disease, can be transmitted between domestic sheep and bighorn sheep. At present, no animals in the planning area suffer from chronic wasting disease, but the disease is spreading toward the area. Disease can impact big game populations and lead to long-term reduction in survival and recruitment resulting in stagnant or declining populations over many years.

Management challenges for big game species include poor habitat conditions, fire management, drought, increased development and urbanization, habitat fragmentation, motorized travel, disease, and the impacts of grazing on the frequency, quality, and composition of key forage species. The BLM and the WGFD continually coordinate and evaluate actions affecting herd units and habitat conditions to determine appropriate management direction.

Some holders of BLM livestock grazing permits and/or leases have supported wildlife and habitat in a number of ways. Base properties are often used by wildlife as habitat in a manner that would be lost if the property were subdivided. As identified in the *Socioeconomic Resources* section, habitat has been adversely affected by the subdivision of former ranches. Many ranchers, particularly in the Lander Slope area, have placed wildlife conservation easements on their private properties, which protects their use for wildlife habitat. This appears to be a trend that is increasing. The management challenge is for BLM to find ways to partner with ranchers to encourage and support the conservation efforts that benefit wildlife, particularly in the WUI.

Pronghorn

Pronghorn are a unique animal of the western plains and are the only living species in their taxonomic family (Antilocapridae). Wyoming is the center of the pronghorn's range. Pronghorn

inhabit a variety of open rangeland habitat types throughout the planning area and forage primarily on shrubs, especially on sage species. Common year-round throughout the planning area, pronghorn populations are generally below levels in the mid-1980s, but have been increasing slowly over the past decade and are currently at or above objectives throughout most of the planning area.

Mule Deer

Mule deer are found year-round throughout the planning area. Mule deer use woody riparian-wetland, shrubland, juniper woodland, and aspen woodland habitat types during spring, summer, and fall. During winter, mule deer can be found in juniper and limber pine woodlands, big sagebrush/rabbitbrush, sagebrush steppe, and riparian-wetland habitat types. Mule deer populations are generally below herd unit objectives, but some herds have experienced population increases in recent years due to conservative hunting seasons and licenses. Many factors can contribute to lower populations, including drought, historic heavy forage utilization by livestock, and habitat fragmentation. An increase in juniper establishment in many key mule deer habitats increases cover but decreases desirable browse in these areas. Declines in overall habitat quality have affected the reproduction and survival rates, resulting in less recruitment of young.

Because of the concern for the loss and degradation of mule deer habitat across the West, the Western Association of Fish and Wildlife Agencies (WAFWA) convened a Mule Deer Working Group to look at the various issues affecting mule deer populations (WAFWA 2003). In addition, the WGFD developed the Wyoming Mule Deer Initiative (WGFD 2009b), which is tiered to WAFWA's work in 2009. This initiative looks at the same issues and challenges for mule deer management in Wyoming, such as large-scale developments, housing developments, and oil/gas fields that are altering and fragmenting mule deer habitats.

White-tailed Deer

White-tailed deer use woody riparian-wetland habitats (willow and cottonwood) along the major creeks and rivers for both forage and cover. The status of white-tailed deer is unknown, but populations are likely increasing in riparian-wetland habitats and associated agricultural fields.

Elk

Elk are common year-round throughout the planning area. In summer, elk use aspen and conifer woodlands for security and thermal cover, ranging out into upland meadows, sagebrush/mixed grass, and mountain shrub habitat types to forage. In winter, elk move to lower elevations, foraging especially in sagebrush/mixed grass and mountain shrub habitat types, especially in windswept areas where snow depth is less. Elk generally have stable to increasing populations and are at or above objective numbers for all herd units in the planning area. Elk forage on grasses, which have had fewer impacts from drought conditions than woody plants. Drought conditions have least affected elk herds that migrate from high elevation summer habitats to lower elevation winter habitats.

Moose

Moose are found primarily in the riparian-wetland habitats along the Sweetwater River, Wind River, and Popo Agie River corridors. Moose populations are stable to declining and well below historic levels and herd objective numbers. Contributing to the population decline is the poor condition of many riparian-wetland areas because of drought and historic heavy forage utilization

by grazing animals. Reduced aspen, cottonwood, and willow health in riparian-wetlands and uplands also adversely impact moose. Other contributors to lower moose populations include diseases and parasites and increased mortality from vehicles, fences, and predators.

Bighorn Sheep

Bighorn sheep are present predominantly in the Whiskey Mountain and East Fork areas near Dubois, although there are small populations in the Sinks and North Fork Canyons near Lander and on Green Mountain. Bighorn sheep populations are stable and are at or near population objectives for most herd units. The Whiskey Mountain herd unit is below the population objective, but appears to be increasing. The human presence and disruption associated with the operation and maintenance of the communication site on Whiskey Mountain stresses the bighorn sheep at a time when they are at their most vulnerable due to winter weather conditions. Improvements to habitat, including vegetation treatments, which are unusual in WSAs, have been authorized to improve forage and nutrition. Bighorn sheep typically occur in steep, high mountain terrain. Ridges and slopes, which are normally free of snow, provide forage, while steep rims, and canyon walls provide escape cover (Bighorn Sheep Technical Committee 2006). They prefer herbaceous forage and typically use alpine slopes and meadows and mountain shrub habitat types, primarily foraging on forbs and grasses and converting to browsing on shrubs when snow depths dictate.

Trophy Game

Mountain lion and black bear are classified as trophy game animals in the planning area. Mountain lions are present in habitats with dense cover and rocky, rugged terrain habitats where deer, their primary prey, are present. Mountain lions have been observed throughout the planning area, but are mainly observed along the Wind River front, in the Dubois area, and the Bridger, Rattlesnake, and Green Mountains. Black bear are present in coniferous forests, aspen, and riparian-wetland shrub habitats, and in mountain grasslands. The planning area supports limited black bear habitat. The species is typically found along the Wind River front and in the Dubois area. Mountain lion and black bear populations are relatively stable. It is difficult to estimate the population sizes of these two species due to their secretive nature. Management challenges for trophy game include loss or alteration of habitat from surface-disturbing activities.

Furbearing Animals

Furbearing animals in the planning area include badger, beaver, bobcat, mink, muskrat, marten, and weasel. These species can be found in a variety of habitats throughout the planning area. Population estimates are available on a statewide basis. Trapping seasons have been established for most furbearers, with badgers being taken year-round; other species (e.g., bobcat, muskrat, mink, and weasel) are typically trapped in winter. Trapping dates vary for beaver and marten. Muskrat and mink are usually associated with streams, lakes, and riparian-wetland habitats. Martens inhabit coniferous forests and badgers are common throughout sagebrush/grass habitats. Beaver are common in perennial waters where willows and aspen are plentiful and can be found associated with streams of the Upper Sweetwater, Beaver Creek, and Twin Creek drainages, streams on Lander Slope (including the Popo Agie River drainages), and streams on Green Mountain. Beaver depend on aspen, willow, and cottonwood trees to build and maintain their dams and lodges.

Data on distribution of mink and muskrat populations are not available, but their populations have likely decreased due to a loss of water in some riparian-wetland systems. It is expected that beaver, mink, and muskrat populations are declining due to degraded riparian-wetland conditions

and drought. Water volumes have decreased in many riparian-wetland systems from a loss of water storage capability and from a lack of precipitation. Beaver are no longer present in some streams that historically supported colonies and many beaver dams are not being maintained. Due to a drop in the water table and drier conditions at some riparian-wetland areas, conifers have invaded some riparian-wetland areas adjacent to streams. Conifers take up available water and space, both surface and subsurface, choking out aspen, willow, and cottonwood communities. The reduction in beaver populations has had an impact on the health of the riparian-wetland communities this species formerly occupied.

Drought conditions and loss and degradation of habitats, especially riparian-wetland areas, for furbearing animals present management challenges for these species.

Predatory Animals

According to Wyoming statute, predatory animals include jackrabbit, porcupine, coyote, red fox, raccoon, and skunk. These predator species are found throughout the planning area in a variety of habitats. Populations tend to fluctuate with the availability of prey species and no population estimates exist. Although classified as predators, jackrabbits typically consume grasses, sedges, forbs, and shrubs, and porcupines consume the inner bark of trees, evergreen needles and buds, leaves, small twigs, and herbs. Coyote populations are typically consistent with prey cycles. When rabbit and ground squirrel populations are high, coyote populations also tend to be high. Red fox populations appear to be expanding into new areas. Red fox typically feed on mice, insects, and plant matter in the summer and rabbits in the winter. Raccoons are omnivorous, feeding on a variety of plants and animals, particularly aquatic animals and insects. Skunks feed primarily on grasshoppers, beetles, crickets, butterfly larvae, deer mice, voles, bird eggs, berries, and fruit. It is expected that populations of skunk, raccoon, and porcupine are static to increasing. Predators are not protected by seasons or bag limits; consequently, any number of animals can be hunted or trapped at any time. USDA APHIS-Wildlife Services performs predator control on public lands with little input from the BLM. There are no specific management challenges for predatory animals in the planning area.

Small Game

Common small game species in the planning area include cottontail rabbit, snowshoe hare, and red squirrels. Cottontail rabbits and red squirrels are found throughout the planning area and snowshoe hare are found in the transition area between mountain shrub habitats and coniferous forests. These species are hunted during fall and winter. There are no estimates of population size, mortality, or natality rates for these species. Rabbit and squirrel populations are cyclic, so trends are difficult to determine. Populations generally appear to be stable. Due to the wide distribution of small game species, there are no management challenges in the planning area.

Game Birds

The *Upland Game Bird Habitat Management Plan* (BLM 1992a) provides game bird management direction for the BLM. All game bird species in Wyoming are managed for recreational use (e.g., hunting, bird watching, etc.). Upland game birds include greater sage-grouse, dusky grouse, chukar partridge, gray partridge, pheasant, sandhill crane, and mourning dove. See the *Special Status Species – Wildlife* section for a discussion of greater sage-grouse. Dusky grouse are found in preferred habitats on Green Mountain and on the east end of Crooks Mountain. The forest-woodland edges near South Pass, Lander Slope, and the upper Wind River Valley (Dubois) also support stands of preferred habitat and limited populations of blue and ruffed grouse. Chukar

and gray partridges are found most abundantly among the rolling breaks and sparse grasslands near Lander. The highest quality habitat is in the Sheep Mountain area along Twin Creek, in and adjacent to the canyons in the Lander Slope and Red Canyon areas, and along the south slopes and drainages of the Lysite and Copper Mountains. Pheasants are limited primarily to areas near agricultural fields in the Riverton, Lander, and Shoshoni areas.

Blue and ruffed grouse habitat conditions vary from poor to excellent in different sites. In areas with established populations, chukar populations appear to fluctuate primarily with the severity of winter conditions and weather conditions during spring nesting. There are no specific management challenges for game birds in the planning area.

Migratory Game Birds

There are many waterfowl species in the planning area, including ducks, geese, coots, snipe, and rails. The entire planning area is part of the Central Flyway (one of four major north-south routes for migratory birds, generally avoiding mountain ranges or areas with limited food availability). Natural lakes, streams, and human-made reservoirs are important resting areas for a variety of ducks, geese, and shorebirds. The abundance of waterfowl varies from year to year depending on the availability of water. Generally, waterfowl populations are stable on large waterbodies that have consistent water. All species of geese have had increasing population trends over the last 10 years (BLM 2009a). Drought has affected the availability of water in ponds, small reservoirs, and streams historically used to support broods, thereby reducing the availability of habitat.

Nongame

Nongame species include raptors, neotropical migrants, non-migratory songbirds, mammals, and reptiles and amphibians. Such species are numerous and diverse, especially given the diversity of habitats present in the planning area.

Raptors

Raptor species in the planning area include turkey vultures, osprey, red-tailed hawk, Swainson's hawk, northern harrier, Cooper's hawk, sharp-shinned hawk, rough-legged hawk, golden eagle, merlin, American kestrel, prairie falcon, and numerous owls, including great-horned, long-eared, short-eared, great gray, barn, western screech, northern pygmy, boreal, and northern saw-whet. These species are found in a variety of habitats throughout the planning area. Raptors are sensitive to environmental disturbance and occupy an ecological position at the top of the food chain; thus, they act as biological indicators of environmental quality. *Raptor Habitat Management on Public Lands* (BLM 1992b) guides management of these species. Refer to the *Special Status Species – Wildlife* section of this document for information regarding special status raptor species (e.g., bald eagle, ferruginous hawk, northern goshawk, peregrine falcon, and burrowing owl).

The nesting season is considered the most critical period in the raptor life-cycle because it determines population productivity, short-term diversity, and long-term trends. Most species have specific nest site requirements that are key factors in nest site selection and in reproductive success. These include nesting strata, available prey base, and nest site disturbance. Raptors build nests in a myriad of habitats, including steep cliffs and rock ledges, trees, and on the ground. Raptors also use human-made structures such as barns, utility poles, and tanks as nesting habitat. Golden eagles and prairie falcons usually build their nests on steep cliffs and rock ledges, but other species, such as red-tailed hawks and great-horned owls, often build on these sites. Turkey

vultures will nest on cliffs, but may also use caves or hollow stumps. Golden eagle populations have increased.

Several species of raptors typically nest in trees and most known raptor nests in the planning area are located in cottonwood trees. Swainson's hawks, red-tailed hawks, American kestrels, great horned owls, and screech owls prefer the more open plains and usually nest in trees along drainages. Cooper's hawks, sharp-shinned hawks, long-eared owls, and northern saw-whet owls usually nest in lodgepole pine stands, mixed conifer forests, or aspen woodlands. Because of the dense canopy cover, these nests are difficult to find. Consequently, intensive inventories of these species have been limited to areas targeted for habitat alteration.

Several species of raptors are ground nesters. Short-eared owls typically nest in tall grasslands with sparse sagebrush or shrubland cover. Northern harriers generally nest on the ground in riparian-wetland or marsh habitats.

Management challenges for raptors include habitat degradation and loss. Habitat management has been limited to maintaining upland range sites in satisfactory ecological condition. Range management practices that maintain ranges in good condition will provide an adequate prey base for raptor species. Raptors prey on a variety of species including small mammals, fish, and other birds; the turkey vulture feeds primarily on carrion.

Neotropical Migrants

Neotropical migrants include shorebirds, water birds, and songbirds found throughout the planning area. Every vegetative community type supports various bird species, with riparian-wetland communities having the most diverse array of species. There are no population estimates for many of these species; however, the WGFD has been conducting breeding bird surveys that provide limited information. The *Nongame Migratory Bird Habitat Conservation Plan* (BLM 1992c) and the *Wyoming Partners in Flight Wyoming Bird Conservation Plan* (Cerovski et al. 2001) guide management of neotropical migrants in the planning area.

Audubon Wyoming established four Important Bird Areas (IBAs) in the planning area. These areas provide essential habitat for one or more bird species. The areas include Ninemile Draw, Red Canyon Ranch, Red Desert, and the Sweetwater River Project. The Ninemile Draw and Red Desert IBAs identify habitats for sagebrush-obligate species and the Red Canyon Ranch and Sweetwater River Project IBAs focus on habitats for riparian-wetland migrants.

Species that depend on woody plant communities are generally declining in numbers due to declines in habitat quality and quantity. Species that require herbaceous plants for forage and cover have stable to increasing populations. Due to the declining condition of many riparian-wetland areas, species that depend on these areas for all or part of their life-cycle likely have been impacted. Populations of sagebrush obligate species are declining. Juniper obligate species have generally seen stable to upward trends based on the increase in amount of juniper present throughout the planning area. Management challenges include maintaining the habitat types upon which these species depend.

Mammals

Nongame mammals include species such as mice, rats, voles, ground squirrels, shrews, bats, and prairie dogs, which are found in a variety of habitats throughout the planning area. Bat surveys have been conducted in suitable caves and mines. There are several known maternity roosts and

hibernacula identified in the planning area, primarily the historic mines in South Pass and the Copper Mountains. No estimates of population size are available for any of these nongame mammal species. Refer to the *Atlas of Birds, Mammals, Amphibians, and Reptiles in Wyoming* (Cеровski et al. 2004) for complete habitat descriptions and distribution of nongame mammals.

Nongame mammals play an important role as prey species for many other wildlife. Large carnivores, raptors, and other predatory animals rely on nongame mammals as a food source. As nongame mammal populations fluctuate, so may the populations of the predators that prey on them.

Nongame mammal species that depend on woody plant communities are generally declining in numbers due to declines in habitat quality and quantity. Species that require herbaceous plants for forage and cover have stable to increasing populations. There is no or very little population data for many of these species, so trends cannot be determined. Management challenges include the lack of population data for these species, and maintaining or enhancing the presence of these species and the habitats upon which they depend.

Reptiles/Amphibians

Reptile species in the planning area include greater short-horned lizard, northern sagebrush lizard, eastern yellow-bellied racer, bullsnake, wandering garter snake, and prairie rattlesnake. These species are found throughout the planning area, but typically occur in the more arid shrub-steppe and grassland habitats. The lizard species feed on ants, beetles, grasshoppers, and other insects. The snake species feed on insects, small mammals, frogs, and fish. The greater short-horned lizard, wandering gartersnake, and prairie rattlesnake bear live young, while the other reptiles listed lay eggs. There are no estimates of population size for any of these species. However, it is likely that populations trend downward due to the overall increase in habitat alteration and loss.

Amphibian species in the planning area include tiger salamander, plains spadefoot toad, and boreal chorus frog. In addition, northern leopard frog, Great Basin spadefoot toad, boreal toad, and spotted frog, Wyoming BLM listed Sensitive Species, are also found in the planning area and are discussed in the *Special Status Wildlife* section. These species are typically found in riparian-wetland areas. Tiger salamanders are terrestrial and live in deep burrows near ponds or lakes. They usually only return to the water to breed. The plains spadefoot toad occurs in grassland and shrubland areas and excavates a deep burrow in winter. The boreal chorus frog occurs in marshes, ponds, and small lakes. Amphibians deposit eggs in lakes, reservoirs, marshes, bogs, rain pools, and flooded areas. Tiger salamander larvae remain in water for two months to two years before metamorphosis occurs. Plains spadefoot tadpoles complete metamorphosis in 36 to 40 days, while boreal chorus frogs complete metamorphosis in approximately 60 days. There are no estimates of population size for any of these species. The declining condition of many riparian-wetland areas, combined with drought, has adversely impacted amphibian populations and populations are likely on a downward trend. Management challenges include maintaining a variety of habitat types and components in proximity to provide for the requirements of reptiles and amphibians.

Special Status Species – Introduction

Special status species include species listed or proposed for listing under the ESA, together with species designated internally as BLM sensitive by the State Director. Species designated as BLM sensitive must be native species found on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of species through management, and

either (1) there is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at a risk across all or a significant portion of the species range, or (2) the species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.

Several policies and agreements guide management of special status species and their habitats in the planning area. In March 1990, the WGFD and the BLM signed an MOU with the purpose of strengthening the cooperative approach to the management of wildlife and wildlife habitat on public land between the two agencies and to encourage them to work together to develop, enhance, maintain, and manage wildlife resources, including planning and sharing data concerning biological resources.

The BLM prepares the Wyoming Sensitive Species Policy and List (BLM 2010b) to focus species management efforts toward maintaining habitats for these species. The goals of this policy include:

- Maintaining vulnerable species and habitat components in functional BLM ecosystems
- Ensuring special status species are considered in land management decisions
- Preventing a need for species listing under the ESA
- Prioritizing needed conservation work with an emphasis on habitat

BLM Manual 6840, Special Status Species Management, establishes policy for management of species listed or proposed for listing pursuant to the ESA and BLM sensitive species on BLM-administered lands. The goals and objectives of this policy are to (1) conserve listed species and the ecosystems on which they depend and (2) ensure that actions requiring BLM authorization or approval are consistent with the conservation needs of special status species and do not contribute to the need to list special status species either under the provisions of the ESA or BLM Manual 6840. In addition, management actions for federally listed species are often derived through the consultation process (Section 7 of the ESA).

The USFWS provides regulatory oversight for all species that are listed, proposed for listing, or are candidates for listing under the ESA. Following status review of proposed or candidate species, the USFWS determines whether a species warrants protection under the ESA. A species that does not warrant protection may remain or be placed on the Wyoming BLM Sensitive Species list. The USFWS also administers designation of critical habitat for listed species and the MBTA, which protects migratory bird species whether they are hunted (e.g., waterfowl) or not (e.g., songbirds). In accordance with the ESA, the USFWS oversees the management of federally listed species and the designation of critical habitats. Any action a federal agency proposes that (1) could adversely impact a federally listed species or (2) will result in jeopardy or adverse modification of critical habitats requires formal consultation. Any action a federal agency proposes that (1) could affect – not likely to adversely affect or (2) could affect – could have beneficial impacts to a federally listed species requires informal consultation.

The BLM is responsible for managing habitat; state and federal wildlife management agencies oversee the management of special status wildlife and fish species. The WGFD has developed a

list of species of greatest conservation need for Wyoming. Information regarding these species can be found on the WGFD website (<http://gf.state.wy.us/index.asp>).

The Wyoming BLM mitigation guidelines for surface-disturbing and disruptive activities include wildlife mitigation guidelines (Appendix M (p. 1595)). These guidelines identify seasonal restrictions on surface disturbance that have the potential to affect special status species habitat, such as greater sage-grouse habitat.

Standard 4 of the Wyoming Standards for Healthy Rangelands ensures that habitats that support or could support threatened, endangered, and BLM-designated special status species will be maintained or enhanced. Indicators that are used to assess standard 4 include the presence of invasive plant species, species diversity, age class distribution, population trends, habitat fragmentation, and other indicators associated with upland and riparian-wetland standards (Appendix J (p. 1537)).

In the planning area, the BLM determines the presence of special status species on a case-by-case basis. In addition, the BLM relies on the Wyoming Natural Diversity Database inventory and modeling to help in determining the presence of special status species in areas where survey information is not available. The Wyoming Natural Diversity Database maintains a list of Wyoming species of special concern and provides information on global and state abundance, legal status, and state distribution. WYNDD considers species in Wyoming to be of special concern if (1) the species is vulnerable to extinction at the global or state level due to inherent rarity, (2) the species has experienced a substantial loss of habitat, or (3) the species is sensitive to human-caused mortality or habitat disturbances.

Special status plants, fish, and wildlife species considered in this analysis are those listed as threatened or endangered under the ESA, those proposed for listing or are candidates for listing under the provisions of the ESA, or those designated by the BLM State Director or the State of Wyoming as sensitive (BLM sensitive species).

3.4.7. Special Status Species – Plants

The BLM is responsible for managing habitat for special status plant species. The planning area contains potential habitat for 15 special status plant species. One species is listed as endangered, 2 species are listed as threatened, 1 species is a candidate, and 11 additional species are on the Wyoming BLM sensitive species list. Table 3.40, “Special Status Plants in the Planning Area” (p. 408) identifies these special status plant species. There is designated critical habitat for one species (desert yellowhead) in the planning area. In addition, the western prairie fringed orchid is a threatened plant that does not occur in the planning area but occurs in downstream riverine habitat in Nebraska. This species is considered when analyzing water depletion activities in the Sweetwater River watershed in the planning area.

Table 3.40. Special Status Plants in the Planning Area

Common Name	Scientific Name	Status
Blowout penstemon	<i>Penstemon haydenii</i>	Endangered
Desert yellowhead ¹	<i>Yermo xanthocephalus</i>	Threatened
Ute ladies’-tresses	<i>Spiranthes diluvialis</i>	Threatened
Whitebark pine	<i>Pinus albicaulis</i>	Candidate
Barneby’s clover	<i>Trifolium barnebyi</i>	BLM Sensitive
Beaver Rim phlox	<i>Phlox pungens</i>	BLM Sensitive

Common Name	Scientific Name	Status
Cedar Rim thistle	<i>Cirsium aridum</i> var. <i>purpureus</i>	BLM Sensitive
Dubois milkvetch	<i>Astragalus gilviflorus</i>	BLM Sensitive
Fremont bladderpod	<i>Lesquerella fremontii</i>	BLM Sensitive
Limber pine	<i>Pinus flexilis</i>	BLM Sensitive
Meadow pussytoes	<i>Antennaria arcuata</i>	BLM Sensitive
Owl Creek miner's candle	<i>Cryptantha subcapitata</i>	BLM Sensitive
Persistent sepal yellowcress	<i>Rorippa calycina</i>	BLM Sensitive
Porter's sagebrush	<i>Artemisia porteri</i>	BLM Sensitive
Rocky Mountain twinpod	<i>Physaria saximontana</i> var. <i>saximontana</i>	BLM Sensitive
Source: BLM 2010b		
¹ There is designated critical habitat for this species in the planning area.		
BLM Bureau of Land Management		

The various climates, topography, soils, rock cliffs, and outcrops provide a diverse landscape in the planning area for special status plant species. These species can be found in grassland and shrubland communities, riparian-wetland and wetland habitats, and other habitats, including rocky outcrops and badlands. Due in large part to their rarity and lack of comprehensive inventories, precise information regarding the location, population size, and condition of each population in the planning area is relatively unknown. A brief description of each of the 15 special status plant species follows. Unless otherwise noted, there is no specific information on trends and occurrences for each of the species.

Blowout Penstemon

Blowout penstemon is listed as an endangered species. No blowout penstemon populations have been identified in the planning area; however, this species does occur in the neighboring BLM Rawlins planning area. This member of the figwort family takes its name from its typical type of habitat; a “blowout” depression is a sparsely vegetated area in sand dunes caused by wind erosion. Blowout penstemon is found primarily on the rim and lee slopes of blowouts, and associated steep slopes deposited at the base of foothills. This species occurs at elevations of 5,860 to 7,440 feet (Heidel 2008). Approximately 100 acres of identified sand dune habitat exists for blowout penstemon south of Green Mountain in the planning area, however a 2000 survey conducted by WYNDD personnel yielded no plants. Threats to this species might include habitat loss and degradation from sand mining, water development, energy development, motorized travel and associated destabilization, or spread of invasive species (Heidel 2008).

Desert Yellowhead

Desert yellowhead, listed as a threatened species, occurs in the planning area. The planning area contains the only known populations and designated critical habitat for desert yellowhead in the world. The initial population was discovered in 1990 and occurs in an area of approximately 8 acres that appears to be associated with a specific geologic formation. The population increased from approximately 9,300 plants in 1995 to approximately 13,200 plants in 2000. The plant occurs in sparsely vegetated cushion plant communities on low slopes, rim margins, colluvial fans, and bottoms in deflation hollows (Fertig and Heidel 2002). The USFWS has designated critical habitat for this population; the area is closed to vehicle traffic and withdrawn from locatable mineral exploration and development (Map 67). In 2010, a new population was discovered approximately 4 miles northeast of the original population. Plants in this population occupy approximately 1 acre. There are approximately 400 plants located within 7 subpopulations that are scattered on

escarpment slopes, generally south-facing, and on gravelly silt loam derived from the White River Formation. The two populations vary in the geology and vegetative composition of the sites. The second site is not included within the critical habitat boundary. Threats to this species include trampling and incidental grazing by livestock and wild horses, mineral development, ROW authorizations, and cross-country vehicle travel. Conservation measures have been developed as part of the Biological Assessment and the USFWS is working on a recovery plan for the species.

Ute Ladies'-tresses

Ute ladies'-tresses is listed as a threatened species. Ute ladies'-tresses is found on moist peat, sand, silt, or gravel soils near wet meadows, springs, lakes, ponds, or perennial streams. No Ute ladies'-tresses have been identified in the planning area; however, there is potential habitat for this species. Ute ladies'-tresses is known to occur in the neighboring BLM Rawlins planning area. Threats to this species include energy development, subdivision development, invasive plant species, and water developments (Heidel 2007).

Whitebark Pine

Whitebark pine, a USFWS candidate species, primarily occurs on cold and windy subalpine and alpine sites above 8,000 in elevation. Potential habitat exists in the Dubois area near the interface with the Shoshone National Forest; however, the species has not been confirmed on BLM-administered lands. Whitebark pine is declining throughout its range from mortality associated with mountain pine beetle and white pine blister rust. Whitebark pine is a major food source for the grizzly bear, a species listed as threatened under ESA.

Barneby's Clover

Barneby's clover is a BLM sensitive species. A local endemic known only from the southeastern foothills of the Wind River Range and southern Beaver Rim, this plant occurs on ledges, crevices, and seams on reddish-cream Nugget Sandstone outcrops at 5,600 to 6,700 feet elevation predominantly in the Red Canyon area. In 1986, it was estimated the Red Canyon populations, which occur predominantly on BLM-administered lands, consisted of approximately 11,000 plants. Subsequent surveys indicate the population is stable and the species is long-lived. Threats such as livestock grazing are very low due to the plant's largely inaccessible habitat. Herbivory by rabbits, rodents, and insects may occur, but would not be considered threatening to this species. Barneby's clover may be displaced in advanced succession or die back in drought (Heidel 2009a).

Beaver Rim Phlox

Beaver Rim phlox is a BLM sensitive species. Endemic to the Wind River basin and the southeastern foothills of the Wind River Range, this plant occurs on sparsely vegetated slopes on sandstone, siltstone, or limestone substrates at 6,000 to 7,400 feet elevation. The species is currently known from 31 occurrences in the state. In 1990, the population was estimated to be 200,000 plants within 2 populations, predominantly on BLM-administered lands in the Beaver Rim area. Since that time, additional populations have been discovered in the Red Canyon and Sand Draw areas as well as in Colorado, more than doubling the population estimate. Observations suggest populations are stable. Potential threats include surface disturbance associated with oil and gas development, and road, pipeline, pump station, and transmission line construction (Heidel 2009b).

Cedar Rim Thistle

Cedar Rim thistle is a BLM sensitive species. Known from 12 occurrences in Wyoming with populations estimated at 50,000 plants in 1995, this species prefers barren, chalky hills, gravelly slopes, and fine textured, sandy-shaley draws at 6,700 to 7,200 feet elevation. It is found in the Beaver Rim area in the planning area. Populations are likely stable, although long-term trend data are lacking. Eleven of the 12 sites are entirely on BLM-administered lands and the twelfth site is on BLM and State of Wyoming Lands. Threats to Cedar Rim thistle include herbicide treatment or release of biocontrol insects intended to control other thistle species, and soil erosion or displacement of plants by OHVs (Fertig 2000a).

Dubois Milkvetch

Dubois milkvetch is a BLM sensitive species. Known only in the area around Dubois, this species occurs near barren shale, limestone, or redbed badlands, on slopes and ridges from 6,900 to 8,800 feet in elevation. As of May 2011, WYNDD identified 11 occurrences of the species totaling approximately 100,000 to 150,000 plants. Because of the interspersed land pattern in the Dubois area, the species occurs on BLM, State of Wyoming, private, WRIR tribal, and Wyoming Game and Fish Commission lands. No trend data are available, but there is little evidence to suggest a large-scale population decline. Potential threats to this species include soil erosion and compaction by OHVs and urban expansion in the Dubois area (Fertig 2000b).

Fremont Bladderpod

Fremont bladderpod is a BLM sensitive species. Endemic to the east slope of the Wind River Range, this sensitive species can be found on rocky limestone slopes and ridges at 7,000 to 9,000 feet elevation. As of 2000, the species was known from 9 occurrences with a total population size estimated at 50,000 to 60,000 individuals. The species is found on BLM-administered lands near Limestone Mountain and north of Sweetwater Canyon, and on adjacent Shoshone National Forest lands. Potential threats to this species include limestone quarrying and road construction (Fertig 2000c).

Limber Pine

Limber pine is a BLM sensitive species. This plant is widespread but patchy across the West and occurs at timberline and at lower elevations with sagebrush. Associated species are lodgepole pine, Engelmann spruce, whitebark pine, Douglas-fir, subalpine fir, Rocky Mountain juniper, mountain mahogany, and common juniper. Occurrences are not typically documented in rare plant databases, making population estimates difficult. Limber pine is found predominantly in the planning area along the Wind River Range near Dubois, Lander, and South Pass, and in the Green Mountain area. Potential threats include blister rust, mountain pine beetle, dwarf mistletoe, and climate change.

Meadow Pussytoes

Meadow pussytoes is a BLM sensitive species. This plant species occurs in moist, hummocky meadows, near seeps or springs surrounded by sagebrush/grasslands at 4,950 to 7,900 feet elevation. There are 23 known occurrences of meadow pussytoes in Wyoming, with all but 1 population located in Fremont County. The species is found predominantly on BLM-administered lands in the South Pass and Sweetwater Canyon areas within the planning area. In 1995, the population estimate was approximately 130,000 individuals, and data indicates a slight downward trend. Potential threats to this species include trampling by OHVs, mineral development, and water projects (Fertig 2000d).

Owl Creek Miner's Candle

Owl Creek miner's candle is a BLM sensitive species. Considered endemic to the Owl Creek Mountains and Bridger Mountain Range and northern Wind River Basin, this species occurs on sandy-gravelly slopes and desert ridges on Wind River formation sandstones at 4,700 to 6,000 feet elevation. The species is known from five sites in Fremont County that are on BLM-administered and WRIR tribal lands. In 1995, the total population was estimated at approximately 38,000 plants on less than 1,500 acres. The current population trend is assumed to be stable. Threats to this species are low due to its habitat being inaccessible; however, this small natural range of this species makes it vulnerable to extirpation from natural events (Fertig 2000e).

Persistent Sepal Yellowcress

Persistent sepal yellowcress is a BLM sensitive species. This riparian-wetland species occurs along riverbanks and shorelines, usually on sandy soils near the high water line at 3,660 to 6,800 feet elevation. There are 28 known occurrences in Wyoming with 1 occurrence located on private land in the planning area. Total population size for the species in Wyoming is estimated at 25,000 plants; long-term trend data are not available. Individual colonies can vary in size in response to yearly flooding levels. Potential habitat for this species is generally protected by a prohibition on disturbance or development within 500 feet of riparian-wetland areas. Threats to this species include changes in water management that reduce the periodicity of flooding, competition from invasive species, herbicide spraying, trampling by livestock, recreation activities, and coal mining (Handley and Heidel 2008).

Porter's Sagebrush

Porter's sagebrush is a BLM sensitive species. This sensitive plant inhabits sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes at 5,300 to 6,500 feet elevation and is endemic to the Wind River basin. Known from eight occurrences in Wyoming, six occurrences are located on BLM-administered lands in the planning area. Although computer modeling suggests that there might be suitable habitat for this species across much of the planning area, the species has primarily been found in the Sand Draw and Lysite areas of the planning area. Population estimates vary from the low hundreds to low thousands, and short-term data suggest that populations are stable. Threats to this species include habitat modification due to oil and gas development, road building, and vehicle disturbance (Fertig 2000f).

Rocky Mountain Twinpod

Rocky Mountain twinpod is a BLM sensitive species. Known from 18 occurrences in Wyoming, mostly in Fremont and Hot Springs Counties, this species occurs on sparsely vegetated rocky slopes of limestone, sandstone, or clay at 5,600 to 8,300 feet elevation. Of the six sites in the planning area, one is on BLM-administered lands, and the rest are on private lands. Populations tend to be small and are assumed to be stable. Potential threats to this species include road construction, pipeline construction, and OHV use (Fertig and Mills 2000).

Management Challenges for Special Status Species – Plants

The special status plant species described above are difficult to survey except during their flowering periods and might be disturbed by activities (e.g., grazing, motorized travel, and energy development) proposed or permitted during other seasons of the year. Management challenges for special status plant species include declining populations for select species;

drought and other natural events; climate change; the spread of invasive species; maintaining PFC for riparian-wetland habitats; vegetation treatment with prescribed fire or herbicides; lack of periodic disturbance events (e.g., fire and flood); physical trampling (e.g., OHV use); loss of habitat resulting from altered hydrology; and challenges presented by special status plant populations occurring over multiple land ownerships. While threats to some species may remain low due to the remoteness of habitat, threats to other species could increase despite distance or restricted access. The BLM requires surveys for special status plants prior to authorizing surface disturbance on site-specific locations. The initially discovered larger population of desert yellowhead is protected with a motor vehicle closure and mineral withdrawal.

3.4.8. Special Status Species – Fish

Fish habitats in the planning area include perennial and intermittent streams that support fish through at least part of the year. The Wind River and North Platte watersheds are the two major drainages in the planning area. The condition of fish habitat is related to hydrologic conditions of the upland and riparian-wetland areas associated with or contributing to a specific stream or waterbody. Aquatic habitat quality varies by location and orientation to geographic landforms and vegetation. Refer to the *Fish and Wildlife Resources – Fish* section of this document for more information about fish habitat in the planning area.

No federally listed fish species are known to occur in the planning area. The Yellowstone cutthroat trout is the only BLM sensitive fish species and only native trout in the planning area. This species is found in the Wind River drainage near Dubois. This drainage lies in the southern extent of the Yellowstone ecosystem. The species is found in relatively clear, cold streams such as the East Fork of the Wind River and its tributaries.

Sauger and burbot are WGFD species of concern and are found in the planning area. Actions affecting water quality and quantity for waters in which these species occur and upstream tributaries could adversely impact spawning success and the survival of early life stages for these species. Early life stages are sensitive to environmental conditions and decreasing turbidity during spring could lead to increased predation of larval fish.

Sauger are present in the Wind River, Little Wind River, Popo Agie River, Little Popo Agie River, and Boysen Reservoir. Core spawning areas for sauger are in the Little Wind River downstream of the confluence with Beaver Creek and in the Popo Agie River upstream of its confluence with the Little Wind River. Lower Beaver Creek is ephemeral, which results in turbid spring flushes. Actions that could cause a shift toward perennial flow in Beaver Creek could result in clearer discharge and would be undesirable. Actions affecting water quantity and quality in the lower reaches of Beaver Creek could affect spawning success for sauger.

Burbot are present in Torrey Creek, Wind River, Popo Agie River, and Boysen Reservoir. Burbot spawn in January and February and prefer clear water. Threats that could affect spawning success for burbot would be activities that increase warm water or increase turbidity and sedimentation during late fall and winter.

In addition, the Sweetwater River drainage in the planning area is part of the North Platte system, which is subject to water depletion limitations to protect threatened and endangered species, including special status fish species, downstream and outside the planning area. Water depletions upstream can change the velocity, volume, and timing of downstream river water flows. Water development projects (e.g., dams, reservoirs, water and sediment control basins,

irrigation diversions, sand and gravel mining, and wetland creation) have altered historic surface water hydrographs (e.g., water flow timing, volume, and velocity) in the North Platte River ecosystem through consumption and evaporation. The BLM consults with the USFWS for activities that might result in water depletions occurring in the Sweetwater River watershed. Additional information regarding Platte River-dependent special status species is available at <http://www.fws.gov/mountain-prairie/wtr/PlatteRiver.htm>.

Management Challenges for Special Status Species – Fish

Management challenges for the Yellowstone cutthroat trout include drought and other natural events, low water flows, sediment loading, declining population trends, and maintaining habitat for this species. Drought conditions have affected the volume of water available in streams that support Yellowstone cutthroat trout and have generally led to declines in the population. Low water flows can affect the timing and success of spawning efforts and lead to reduced reproduction rates. Some streams have experienced a loss in the number of deep pools needed to over-winter fish. In recent years, high water runoff that flushes sediment out of the deep pools and cleans spawning beds has been lacking. As the danger of wildfire increases, the likelihood of habitat degradation from the use of fire retardants also increases. Although there are no management protections specific for this species, Yellowstone cutthroat trout could be afforded some protection from sediment loading through the restriction of surface-disturbing activities within 500 feet of riparian-wetland areas.

Surface-disturbing activities can contribute sediment to spawning areas and can alter stream hydrology and degrade the stream or its water quality, which could adversely impact sauger and burbot habitat, reproduction, and survival. Changes in weather patterns (e.g., drought) could contribute to changes in stream systems such as flow, temperature, and turbidity. Surface discharge of produced water that would substantially alter temperature and/or turbidity of receiving waters could adversely impact the survival and reproductive potential of sauger in some systems.

3.4.9. Special Status Species – Wildlife

One endangered wildlife species (black-footed ferret), two threatened wildlife species (grizzly bear and Canada lynx), and one candidate species (greater sage-grouse) are known to occur in the planning area. Twenty-five additional BLM sensitive species are known to occur or have potential habitat in the planning area. The USFWS identified the North American wolverine as a candidate species in December 2010. The North American wolverine generally inhabits areas at or above timberline and there are no BLM-administered public lands in the planning area that support this type of habitat. Therefore, the North American wolverine will not be discussed further in this document. Table 3.41, “Special Status Wildlife Known to Occur in Suitable Habitat” (p. 415) and the discussion of special status wildlife species in this section are organized by the applicable Wyoming statutory categories identified in the *Fish and Wildlife Resources – Wildlife* section. There is critical habitat for Canada lynx in the planning area; however, the critical habitat is on USFS-managed land, not BLM-administered land. Map 66 identifies Canada lynx analysis units in the planning area; Governor’s greater sage-grouse Core Area and greater sage-grouse leks are displayed on Map 63.

Table 3.41. Special Status Wildlife Known to Occur in Suitable Habitat

Wyoming Statutory Wildlife Category	Common Name	Status
Trophy Game	Grizzly bear	Threatened
Predatory Animals	Gray wolf	Non-essential, Experimental (delisted September 30, 2012) ¹
Game Birds	Trumpeter swan	BLM Sensitive
	Greater sage-grouse	Candidate BLM Sensitive
Nongame Raptors	Bald eagle	BLM Sensitive
	Northern goshawk	BLM Sensitive
	Ferruginous hawk	BLM Sensitive
	Peregrine falcon	BLM Sensitive
	Burrowing owl	BLM Sensitive
Nongame Neotropical Migrants	White-faced ibis	BLM Sensitive
	Mountain plover	BLM Sensitive
	Long-billed curlew	BLM Sensitive
	Yellow-billed cuckoo	BLM Sensitive
	Sage thrasher	BLM Sensitive
	Loggerhead shrike	BLM Sensitive
	Brewer's sparrow	BLM Sensitive
Nongame Mammals	Sage sparrow	BLM Sensitive
	Canada lynx	Threatened
	Black-footed ferret	Endangered
	Long-eared myotis	BLM Sensitive
	Spotted bat	BLM Sensitive
	Townsend's big-eared bat	BLM Sensitive
	Pygmy rabbit	BLM Sensitive
	White-tailed prairie dog	BLM Sensitive
Nongame Amphibians	Swift fox	BLM Sensitive
	Northern leopard frog	BLM Sensitive
	Great Basin spadefoot toad	BLM Sensitive
	Boreal toad	BLM Sensitive
	Spotted frog	BLM Sensitive
Sources: USFWS 2008a; BLM 2010b		
¹ The delisting of the gray wolf occurred between the release of the Draft RMP and EIS and the Proposed RMP and Final EIS. Pursuant to BLM Manual 6840, all federal candidate species, proposed species, and delisted species in the five years following delisting will be conserved as BLM sensitive species; therefore, the analysis of the gray wolf in this document has been carried forward.		
BLM Bureau of Land Management		

Special status wildlife species in the planning area occupy a variety of habitat types, including sagebrush shrublands, grasslands, and riparian-wetland and wetland habitats. There are no comprehensive data on population numbers and distribution in the planning area for most special status species. Unless otherwise noted, specific information on distribution and occurrences for each of the species is not available. The BLM consults with the USFWS before implementing any project that might impact federally listed species or their habitats. Measures to protect special status wildlife species are noted below, as applicable.

Trophy Game

The grizzly bear, a threatened species, is the only trophy game animal known to occur in the planning area. The USFWS delisted the grizzly bear in April 2007, but a court decision vacated the delisting rule and the species was relisted in September 2009. The grizzly bear can be present in dense forests to sub-alpine meadows and arctic tundra. Grizzly bear encounters with domestic livestock have been recorded in the Dubois area. Grizzly bears have expanded their range due in part to increasing population numbers resulting from protections for this species. In addition, during drought years, forage shortages have caused individual grizzly bears to range farther in search of adequate food supplies. Threats to the grizzly bear include loss and fragmentation of habitat, conflicts between grizzly bears and recreationists, and conflicts between grizzly bears and livestock. These conflicts typically result in the removal or death of the bear.

Furbearing Animals

No furbearing special status species are known to occur in the planning area.

Predatory Animals

The gray wolf was delisted by the USFWS on September 30, 2012. It was previously listed as an experimental population, non-essential, and this species primarily inhabits forested areas. Wolves were reintroduced to the Greater Yellowstone region in 1994 and the reintroduction has been successful in establishing a wide-ranging population with many packs in northwestern Wyoming. At present, the WGFD classifies gray wolves as predatory animals (Cervinski et al. 2004). Gray wolves could be classified as trophy game animals in the northwestern part of the planning area near Dubois if they are delisted from the ESA. Outside of this area, gray wolves would be classified as predatory animals and managed as furbearers. Gray wolves are known to occur in the northwestern corner of the planning area and are believed to occur elsewhere in the planning area. Threats to gray wolves include conflicts between gray wolves and livestock, conflicts between gray wolves and humans, and habitat loss and fragmentation.

Game Birds

Two special status game birds, the trumpeter swan and the greater sage-grouse, occur in the planning area. In March 2010, the USFWS designated the greater sage-grouse as a candidate species for listing. Both species are BLM sensitive species.

The trumpeter swan is generally associated with larger waterbodies such as lakes and rivers. In the planning area, most observations of trumpeter swans have been along the Sweetwater and Wind Rivers.

The greater sage-grouse is the most common and widespread game bird in the planning area and occurs in sagebrush habitats. As of 2011, there were 178 documented occupied strutting grounds (leks) in the planning area, with another 50 leks on the WRIR, and 5 leks on Bureau of Reclamation land.

The planning area has been identified as supporting some of the best greater sage-grouse habitat in Wyoming and throughout the species range (Connelly et al. 2004). Of particular importance is the area between the Hudson and the Sweetwater River, which contains important breeding, nesting, brood-rearing, and winter habitats. The area is mostly undeveloped; thus habitats are mainly intact and not fragmented. The Audubon Wyoming designated the Ninemile Draw area south of Hudson as an IBA for greater sage-grouse. The area has been identified as a greater sage-grouse stronghold for breeding populations in western North America and contributes to the

conservation of the species. Given the area's relatively undisturbed greater sage-grouse habitat, several research projects have been conducted in the area that have statewide application. Because of the knowledge about greater sage-grouse numbers and population trends, their seasonal ranges, and the opportunity to use the area to study greater sage-grouse, this area was nominated by the Wind River-Sweetwater River Sage-Grouse Local Working Group for ACEC designation. Subsequently, the WGFD requested that a much larger area that extends east and south of the Local Working Group nomination be considered for ACEC designation.

The Governor of Wyoming issued Executive Order 2008-2, which was superseded by 2010-4 and subsequently replaced by 2011-5, for increased protection of greater sage-grouse. The Executive Order delineates Core Area in the state, including the planning area, and places limits on surface disturbance and habitat fragmentation in Core Area. Map 63 identifies the greater sage-grouse leks and the Governor's Core Area in the planning area. The Governor's greater sage-grouse Core Area covers 2,664,509 acres (all ownership types) in the planning area.

Greater sage-grouse populations have been declining across the western United States, prompting several petitions to list them as threatened under the ESA. In March 2010, the USFWS announced its 12-month finding that listing of the greater sage-grouse is "warranted but precluded." Thus, the species is designated as a candidate for listing with the USFWS and will be reviewed annually to determine if the listing status should be changed. As identified in the USFWS 2010 finding, the greater sage-grouse population in the planning area is part of Management Zone II, one of seven Management Zones for greater sage-grouse delineated by the WAFWA based upon ecological and biological attributes, which includes greater sage-grouse populations throughout the Wyoming Basin (USFWS 2010). Threats to greater sage-grouse in Management Zone II are discussed at length in the USFWS finding and would apply to the planning area.

Since USFWS made their 2010 finding of "warranted but precluded" for greater sage-grouse, additional guidance has come out of the BLM's Washington and Wyoming State Offices regarding management of greater sage-grouse habitats. In December 2011, a greater sage-grouse National Technical Team developed science-based recommendations and regulatory mechanisms to conserve or restore greater sage-grouse habitat that are to be considered in RMPs (BLM 2011a). In February 2012, the Wyoming State Office issued policy for management of greater sage-grouse habitats that incorporates the management outlined in Executive Order 2011-5 (BLM 2012d).

Wildfire and prescribed fire have been identified as risks to sagebrush in areas receiving less than 12 inches of precipitation per year. More than 75 percent of greater sage-grouse Core Area receives less than 12 inches of annual precipitation.

Greater sage-grouse population numbers are difficult to estimate, but long-term data collected from counting males on leks provides insight to population trends. Based on population estimates, greater sage-grouse population numbers in the late 1960s and early 1970s were likely two to three times greater than current numbers. Noticeable declines in greater sage-grouse populations occurred in the 1920s and 1930s, and then again in the 1960s and 1970s (Connelly and Braun 1997). Connelly et al. (2004) reported range-wide declines, averaging 2 percent per year, from 1965 through 2003. Other researchers have concluded that range wide, greater sage-grouse have experienced long-term population declines in the past 43 years.

Greater sage-grouse population levels throughout the planning area plummeted during the 1990s and then experienced a resurgence in the 2000s. This resurgence is thought to be related to precipitation events that promoted grass growth, thus aiding survival of young. Populations in areas of extensive energy development, including fields near Lysite, Moneta, and below

Beaver Rim in the Wind River Basin, have not seen the same degrees of growth as other parts of the planning area. Some areas in Wyoming have experienced substantial greater sage-grouse mortality related to the presence of mosquitoes that carry WNV. Water impoundments associated with oil and gas fields and water reservoirs are mosquito breeding grounds and have been linked to WNV. A few cases of greater sage-grouse deaths as a result of WNV have been documented in the planning area; however, it is not possible to quantify the extent of mortality because scavenging animals often consume the greater sage-grouse carcass shortly after death. The BLM recently identified WNV as a threat of extirpation in the Buffalo Field Office planning area. Populations and patterns of greater sage-grouse are quite different, and long-term impacts, such as whether surviving birds develop an immunity to the virus in themselves or offspring, are not known.

At present, human-caused disturbance is seasonally restricted within 2 miles of greater sage-grouse strutting grounds to mitigate impacts to breeding and nesting. Additionally, NSO restrictions apply within a quarter-mile of an occupied lek. Based on recent research suggesting the current protective buffers do not provide adequate protection for nesting greater sage-grouse, and that greater sage-grouse tend to avoid nesting near vertical structures (e.g., overhead utility lines, and wind turbines), the BLM is considering extensive modifications to greater sage-grouse protections nationwide. Threats to greater sage-grouse include degradation, loss, and fragmentation of habitat, predation, WNV, and human disturbance during sensitive periods.

Nongame (Raptors)

The bald eagle, northern goshawk, ferruginous hawk, peregrine falcon, and burrowing owl are BLM sensitive raptor species known to occur in the planning area. All raptors are protected under the MBTA, as are most avian species. For all raptor species, seasonal BLM stipulations that limit human-related activities near nests have been applied to surface-disturbing activities such as ROWs and oil and gas development. “Raptor-proofing” of electrical transmission facilities is required to prevent electrocution of raptors. Threats to special status raptor species include human disturbance during sensitive periods and loss of habitat.

Bald eagle

The bald eagle inhabits large bodies of open water, including lakes, marshes, and rivers, where there is an abundance of tall trees to roost and fish to eat. Along the Middle and Little Popo Agie Rivers and the Wind River, winter sightings of bald eagles have occurred since as early as 1974. At present, there are no known nests on BLM-administered lands; however, there is one nest on USFS-managed land in the planning area. Identified active bald eagle nests and winter roost sites are protected from disturbance within a half-mile of the nest or site. A seasonal protection from disturbing activities is applied from February 1 through August 15 for active nests and from November 1 through April 1 for identified winter roosting areas. Additional restrictions on disturbance within suitable habitat may apply.

Northern goshawk

The northern goshawk is found in coniferous forests, especially Douglas-fir, lodgepole pine, and aspen (Cerovski et al. 2004). The northern goshawk forages in a variety of habitats. There is suitable habitat for the northern goshawk primarily on Green Mountain and Lander Slope. Nests have been documented on Green Mountain.

Ferruginous hawk

The ferruginous hawk occurs in basin-prairie shrublands and mountain-foothills grasslands and usually nests on rock outcrops, tall sagebrush, or in trees. Nests have been documented throughout the planning area. Ferruginous hawk populations maybe declining; many previously active nests have been unoccupied in recent years.

Peregrine falcon

Peregrine falcons nest on tall cliffs and prey mainly on other bird species. Suitable habitat for peregrine falcons in the planning area includes the steep canyons along the Lander Slope and sites near Warm Springs Canyon and Arrow Mountain; they have also been documented in the Dubois area.

Burrowing owl

Burrowing owls are found in grasslands and basin-prairie shrublands. This species uses burrows built by other animals such as prairie dogs for nesting and roosting. Burrowing owls can be found in suitable habitat throughout the planning area.

Nongame (Neotropical Migrants)

There are eight BLM sensitive neotropical migrants in the planning area: white-faced ibis, long-billed curlew, yellow-billed cuckoo, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, and mountain plover. These species occur in a variety of habitats throughout the planning area. The MBTA protects all of these species. Any additional protections are noted below for specific species. Threats to special status neotropical migrants include degradation, fragmentation, and loss of habitat.

White-faced ibis

This species is generally associated with marshlands and has been observed in suitable habitats in the planning area.

Mountain plover

This species is generally found in habitats with little or no vegetation structure, such as grasslands, alkali flats, or low shrubs (e.g., saltbush). Mountain plovers may nest on sites where vegetation is sparse to bare or closely cropped. This species is protected from disturbance during its nesting period (April 10 to July 10). Mountain plover habitat is found throughout the planning area but the most extensive habitat is located in the northeast part of the planning area in the Shoshoni-Moneta-Lysite areas. Prior to May 2011, the mountain plover was a proposed species for listing under ESA. On May 12, 2011, the USFWS announced its decision to withdraw the proposed listing of the mountain plover as a threatened species (76 Federal Register 27756). The mountain plover is a species on the BLM sensitive species list.

Long-billed curlew

The long billed curlew is associated with wetlands, but may nest in dry meadows. This species has been observed in suitable habitats in the planning area.

Yellow-billed cuckoo

The yellow-billed cuckoo is associated with wooded riparian-wetland habitats. There are no occupied habitats for the yellow-billed cuckoo identified in the planning area.

Sage thrasher, loggerhead shrike, Brewer's sparrow, and sage sparrow

These species are associated with sagebrush-steppe or shrubland habitats and can be found throughout the planning area in suitable habitat. Threats to these species are similar to threats for the greater sage-grouse due to occupying similar habitats.

Nongame (Mammals)

There are eight nongame special status mammal species in or with potential habitat in the planning area: black-footed ferret (endangered), Canada lynx (threatened), long-eared myotis (BLM sensitive), spotted bat (BLM sensitive), Townsend's big-eared bat (BLM sensitive), pygmy rabbit (BLM sensitive), white-tailed prairie dog (BLM sensitive), and swift fox (BLM sensitive). These species occupy a variety of habitats in the planning area. The BLM consults with the USFWS on all proposed activities that could impact threatened and endangered species. BLM is committed to the conservation measures for Canada lynx and black-footed ferret in the Statewide Programmatic species-specific consultations. Threats to special status nongame mammals include human disturbance, pesticides that reduce the insect prey base, and degradation, loss, and fragmentation of habitat.

Canada lynx

Canada lynx generally occur in dense coniferous forests at high elevations. Canada lynx have not been documented on BLM-administered land in the planning area; however, there are five Lynx Analysis Units that encompass BLM-administered lands and adjacent larger tracts of USFS-managed land in the northwestern part of the planning area (Map 66). There could be some special status wildlife species, such as the lynx, in the Dubois area, but none have been documented on BLM-administered lands.

Black-footed ferret

The black-footed ferret is found in association with prairie dog colonies in basin-prairie shrublands, sagebrush-grasslands, and foothills grasslands. Prairie dogs constitute the main prey source for black-footed ferrets. Although historically distributed throughout much of Wyoming, the only black-footed ferrets now in the state are in the Shirley Basin/Medicine Bow Management Area in Laramie (outside the planning area). These animals are a reintroduced, experimental population of descendants of the last wild ferrets trapped near Meeteetse in 1981. The only part of the planning area with potential to reintroduce black-footed ferrets is the Pathfinder White-tailed Prairie Dog Complex at the junction of Fremont, Natrona, and Carbon Counties. This area is proposed as an ACEC for protection of the black-footed ferret.

Declines in prairie dog populations, conversion of grasslands to agricultural uses, and prairie dog eradication are tied to the decline of black-footed ferret populations.

Long-eared myotis

The long-eared myotis seasonally inhabits coniferous forests and woodlands and forages over water in these habitats, primarily feeding on beetles and moths. The long-eared myotis is sensitive to human disturbance during hibernation. Habitat alteration, modification or loss of roosting habitat, and toxic chemicals are threats to bat species.

Spotted bat

The spotted bat is known to seasonally roost in cliff crevices near perennial water. The spotted bat is sensitive to human disturbance during hibernation. Habitat alteration, modification or loss of roosting habitat, and toxic chemicals are threats to bat species.

Townsend's big-eared bat

This species requires caves or mineshafts throughout its life-cycle. Suitable habitat in the planning area is limited to abandoned mineshafts. Many mineshafts and adits that support bats have been fitted with "bat grates" that allow use by bats but prevent human entry. The Townsend's big-eared bat is sensitive to human disturbance during hibernation. Habitat alteration, modification or loss of roosting habitat, and toxic chemicals are threats to bat species.

Pygmy rabbit

The pygmy rabbit inhabits dense, tall stands of sagebrush in deep soil. This species has been observed primarily in the area south of the Sweetwater River to the southern Lander Field Office boundary. Because pygmy rabbits do not venture far from these habitats, projects that remove this habitat could affect the pygmy rabbit. Avoiding pygmy rabbit habitat might be sufficient to sustain the population.

White-tailed prairie dog

This species inhabits rolling and level sagebrush-steppe and grassland habitats. Recreational shooting and management as an agricultural pest have contributed to the decline of this species. Conservation measures include avoiding surface-disturbing activities near occupied burrows.

Swift fox

Historically, this species occupied short- or mixed-grass prairies on level to moderately rolling terrain in the Great Plains. Although there is suitable swift fox habitat in the northeastern most part of the planning area, there are no recent observations of this species in the planning area.

Nongame (Amphibians)

There are four BLM sensitive amphibians in the planning area: northern leopard frog, Great Basin spadefoot toad, boreal toad, and spotted frog. These species are associated with riparian-wetland habitats and have been observed in suitable habitat in the planning area. No population estimates are available for these species, although declining populations and/or loss of habitat are the primary reasons for their inclusion on the Wyoming BLM Sensitive Species list. These amphibians are protected by prohibition of surface disturbance or development within 500 feet of riparian-wetland areas. Threats to special status amphibians include changes to water quality and degradation and loss of riparian-wetland areas.

Management Challenges for Special Status Species – Wildlife

Most of the trends that affect other species of wildlife in the planning area also affect special status species. These include habitat degradation and fragmentation, livestock grazing, invasive species, motor vehicles, and climate. Management challenges for special status wildlife species include habitat degradation, fragmentation, and loss; invasive species; and human disturbance during sensitive periods. Limited habitat for some special status species presents challenges to managing for multiple use. For grizzly bears and the gray wolf, limiting human/bear and human/wolf interactions are also management challenges for the BLM. The BLM is committed to

implementing the conservation measures for grizzly bear and gray wolf according to the Statewide Programmatic consultations for these species. Fencing can provide perches for raptors that prey on special status species such as greater sage-grouse. Management challenges for special status raptor species also include collision and electrocution from powerlines. For most neotropical migrants, there is no specific protection other than protections afforded under the MBTA.

3.4.10. Wild Horses

The BLM protects, manages, and controls wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971. This law ensures that healthy herds thrive on healthy rangelands. Horses originally evolved on this continent and disappeared some 10,000 to 12,000 years ago. Spanish explorers introduced modern horses to the west in the 1500s. The BLM manages wild horses as part of its multiple-use mission.

Most wild horses in the nation are found on BLM-administered lands. The BLM is responsible for managing the size and distribution of the herds. Wild horses provide a historic resource of particular interest to the public. However, this species also competes with other grazing species for forage within its range.

As required by the Wild Free-Roaming Horses and Burros Act of 1971, the BLM designated 30 Herd Management Areas (HMAs) with populations totaling approximately 4,400 horses. Those 30 areas comprised roughly 6.6 million acres of public land, 400,000 acres of State of Wyoming land, and 2.5 million acres of privately owned lands. In recognition of the need to consolidate herds to ensure long-term genetic diversity, the BLM combined and consolidated these management areas. At present, there are 16 HMAs in the state and the statewide target is for a wild horse population of 2,700. The planning area has approximately 1,000 horses in seven HMAs (Map 68); there are no burros.

Table 3.42, “Herd Management Areas and Appropriate Management Levels in the Planning Area” (p. 423) identifies the HMAs, appropriate management levels, and the ROD dates. The appropriate management levels were established in 1993 and 1994, from a process that included five years of intensive monitoring, data evaluation, public input, and environmental analysis. Since that time, some boundary adjustments and realignments to the HMAs have been made via the RMP maintenance process. The appropriate management level is the herd population objective for the HMA that would ensure a thriving ecological balance among all the users and resources of the HMA (e.g., wildlife, livestock, wild horses, vegetation, water, and soil). A 2003 Consent Decree between the BLM and the State of Wyoming described the appropriate management level for each HMA in Wyoming as of the date of the decree. A copy of the Consent Decree is available on the BLM Wyoming website. By its terms, the Consent Decree terminates no later than 10 years after its effective date in 2003. The decree addresses inventories of wild horses and gathers. Appendix V (p. 1805) provides additional information regarding wild horse management in the planning area.

Indicators of health for wild horses can be broken down into two main areas: the health of the horses and the vegetative health of the habitat in which they live. Each is a reflection of the other.

Physical and genetic health can be estimated during inventory by observation of body conditions (e.g., the presence of physical abnormalities) at various times of the year. With the elimination of virtually all natural predators, wild horse herd size, unless artificially controlled, would increase. As herd sizes increase, individuals and herds may migrate outside of the existing

boundaries of HMAs. As a result, increased herd size may or may not increase forage utilization within the boundaries of HMAs. Increased forage utilization within HMAs may exceed the established appropriate management levels and may result in over-utilized forage. The health of the vegetative communities in the HMAs is assessed using the Wyoming Standards for Healthy Rangelands (BLM 1997b).

Wild horses graze on the range throughout the year. The BLM uses an animal unit month (AUM) rate of 1.15 for horses. Using this rule, the 1,000 wild horses in the planning area consume 13,800 AUMs annually. By comparison, for the 20-year period 1989 through 2008, the BLM billed an average of 204,507 domestic livestock AUMs per year for authorized livestock grazing in the planning area.

Table 3.42. Herd Management Areas and Appropriate Management Levels in the Planning Area

Herd Management Area	Appropriate Management Level (Number of Horses)	Record of Decision Date
Green Mountain	170 to 300	February 1993
Conant Creek	60 to 100	February 1993
Rock Creek Mountain	50 to 86	February 1993
Dishpan Butte	50 to 100	February 1993
Muskrat Basin	160 to 250	February 1993
Crooks Mountain	65 to 85	May 1994
Antelope Hills/Cyclone Rim	60 to 82	May 1994
Source: BLM 2009a		

Population control is maintained by periodic gathers in which the health of the population is assessed and horses removed to keep the population within the limits of the appropriate management levels and in compliance with the Consent Decree. Fertility control is administered to mares by the anti-fertility vaccine Porcine Zona Pellocida, which has declining impassiveness over time. By the fourth year following injection, the drug has only limited impassiveness. Study has determined that administering the drug does not cause early foaling (BLM 2009a). Natural predation on wild horses does occur in the Antelope Hills/Cyclone Rim HMA, Crooks Mountain HMA, and Green Mountain HMA with documentation showing that mountain lions are the principle predator. Table 3.43, “Wild Horse Removals from 1980 through 2006 by Herd Management Area” (p. 423) lists wild horse removals in the planning area from 1980 through 2006 by HMA.

Table 3.43. Wild Horse Removals from 1980 through 2006 by Herd Management Area

Year	Number Removed
Antelope Hills/Cyclone Rim HMA	
1986	88
1987	184
1988	63
1989	154
2000	59
2001	50
2004	208
2009	77
2012	80
Crooks Mountain HMA	
1985	708

Year	Number Removed
1996	319
1998	220
2002	103
2006	74
2009	0
2012	17
Green Mountain HMA	
1980	255
1984	199
1993	318
1995	88
1996	105
1997	145
2002	155
2003	75
2005	490
2006	89
2009	330
2012	240
Muskrat Basin HMA	
1983	157
1985	285
1986	314
1988	159
1993	195
1995	206
1997	128
2001	152
2004	127
2009	385
Dishpan Butte HMA	
1985	145
1995	214
2001	57
2004	123
2009	109
Rock Creek Mountain HMA	
1985	131
1986	58
1995	10
2001	47
2004	0
2009	27
Conant Creek HMA	
1985	115
1986	21
1993	89
1995	10
2001	66
2004	95
2009	283

Source: BLM 2009a

HMA Herd Management Area

Monitoring of wild horse habitat includes the collection of precipitation data, rangeland condition and trend information, forage utilization data, data for permitted and actual use by livestock by grazing allotment, wildlife use data, and forage requirements. Data collected on wild horses include population counts, reproductive rates, age/sex structure, fertility control work, identification of high use or concentration areas, and other factors that would develop as the herds are studied.

Herd Management Areas

Antelope Hills/Cyclone Rim HMA

The Antelope Hills HMA encompasses 158,609 acres, of which 96,071 acres are BLM-administered surface. The appropriate management level for this HMA is 60 to 82 adult horses. The area is approximately 15 miles south-southeast of Atlantic City at approximately 7,200 feet elevation. The Continental Divide National Scenic Trail (CDNST) bisects the HMA. The area receives 5 to 7 inches of precipitation annually. The predominant vegetation type is sagebrush/grass. Riparian-wetland zones are infrequent but very important to wild horses. The topography ranges from rolling flatlands south of Cyclone Rim to uplifted ridges along Cyclone Rim and abrupt rocky zones interspersed with rolling lands north of the rim to the Sweetwater River.

Many of the horses in this HMA exhibit traits of the Spanish mustang and are a variety of colors. As genetic research continues on the wild horse populations in the Red Desert meta-population (Green Mountain, Crooks Mountain, Stewart Creek, Antelope Hill/Cyclone Rim, and Lost Creek HMAs), the necessity to maintain the population of wild horses in the Antelope Hills/Cyclone Rim HMA in genetic isolation might change, if it is determined that populations adjacent to the HMA share enough genetic material so that the uniqueness of the herd will not be compromised with interbreeding. If surrounding HMAs do not share the uniqueness, further interbreeding could cause this genetic resource to disappear. Continued monitoring and research could result in adjustment to management decisions for the Antelope Hills/Cyclone rim and Lost Creek HMAs. This HMA is an appropriate location for a wild horse viewing scenic loop.

Crooks Mountain HMA

The Crooks Mountain HMA is directly southeast of Sweetwater Station and encompasses approximately 58,425 acres, of which 54,726 acres are BLM-administered surface. The appropriate management level for this HMA is 65 to 100 adult horses. Elevations range from 6,900 to 8,100 feet. The lower elevations receive approximately 10 to 14 inches of precipitation annually; the upper elevations receive 15 to 20 inches. The major vegetation types are sagebrush-grass, woodland, and riparian-wetlands. Topography is generally rolling hills and slopes to the north and south of Crooks Mountain. The Crooks Mountain portion of the herd area is quite steep and broken with mountainous terrain. The area supports substantial wildlife populations of elk, deer, and pronghorn. Most of the horses are bays or blacks, with an occasional paint and/or grey.

Muskrat Basin, Conant Creek, Rock Creek, and Dishpan Butte HMAs

These four HMAs are in the central part of Fremont County. They encompass approximately 375,300 acres of land, of which 337,305 acres are BLM-administered surface. Topography in the area includes high ridges and steep terrain with grand vistas. Beaver Rim, on the western edge of the HMAs, is a high escarpment with sweeping views of the Wind River Mountains, Copper

Mountains, and Owl Creek Mountains. Elevations in the HMAs range from 5,300 to 7,200 feet. The area receives 5 to 12 inches of precipitation a year, depending on elevation, most of it in the form of snow. Domestic cattle and sheep utilize the area during spring, summer, and fall. Vegetation is dominated by various sage and grass species. Elk, deer, and pronghorn also inhabit this area.

While the four HMAs are managed with recognized individual populations, there is no geographic separation of the HMAs and the gates between them remain open for most of the year. As a result, the horses move regularly among the HMAs, helping to ensure their overall genetic health. Horses in these HMAs are a range of colors, most being solid, and their health is good with few apparent problems. Muskrat Basin/Dishpan Butte is an appropriate location for a wild horse viewing scenic loop.

Green Mountain HMA

The Green Mountain HMA encompasses 116,680 acres, of which 99,231 acres are BLM-administered surface. The appropriate management level for this HMA is 300 horses. A full range of colors is present. Most horses are a solid color, but a noticeable number of tobiano paints are present. The horses range from 11 to 15 hands and 750 to 1,000 pounds mature weight. Health is good with few apparent problems.

Topography in the HMA is generally gently rolling hills and slopes north and south of Green Mountain. Green Mountain itself is quite steep, with mountainous terrain and conifer/aspen forests. Elevations range from 6,200 to 9,200 feet, with grand vistas of the Red Desert, Sweetwater Rocks, and the Oregon and California NHTs from the higher elevations. Precipitation ranges from 10 to 14 inches at lower elevations to 15 to 20 inches at higher elevations. Most of the precipitation is in the form of snow. Domestic cattle and sheep utilize the area in all seasons, with summer cattle use predominating. Vegetation around the mountain is dominated by various sage, grass, woodland, and riparian-wetland species. The area supports substantial populations of elk, deer, pronghorn, and moose.

Management Challenges for Wild Horses

Fluctuations in precipitation and drought conditions create management challenges for wild horses by reducing the food available for wild horses. Drought also increases the conflict between wild horses and livestock grazing, an already contentious situation in some parts of the planning area. While the trend for forage reduction started by the drought is expected to continue, drought alone would probably not cause a decrease in herd population below the levels needed to maintain genetic diversity. Successful wolf reintroduction could have an impact on herd size, particularly in harsh winter conditions that limit the horses' ability to evade predators. Wider dispersal of livestock grazing through range developments puts stress on upland range forage, providing competition to wild horses. Fences and cattleguards pose hazards to horses because these features limit the horses' ability to survive winter conditions.

Increasing mineral development affects wild horses as forage is reduced by surface-disturbing activities and the expansion of invasive plants. In HMAs where genetic mixing is desired, development and fragmentation of wild horse habitat can also separate herds and lead to reduced genetic variation, which can affect the long-term health of herd populations. Fragmentation also causes concentration of herd distribution, which can strain available forage.

Although monitoring data indicate horses have some localized impacts on vegetation in some areas near water, current management of the horse herds should not affect these vegetation communities. There could be impacts to rangelands if the horses populations are allowed to increase. Continuing to implement fertility control during gathers would help maintain and improve the rangeland resources. Ongoing studies could verify impacts to riparian-wetland areas.

An additional management challenge is the intrusion of modern development, particularly mineral development, which has the potential to reduce the recreational aspect of viewing wild horses.

3.5. Heritage and Visual Resources

This section addresses the individual resources of cultural, paleontological, and visual resources. Each resource section includes a description of the resource, the existing condition of the resource, and management challenges.

3.5.1. Cultural Resources

Cultural history in the Rocky Mountain west began at least 11,500 years ago, when the first human groups entered this region. Since that time, human occupation of the area appears to have continued to the present without serious interruption.

Prehistoric, Historic and Spiritual/Sacred/Traditional Cultural Properties

Generally, cultural resources can be grouped into three categories: prehistoric resources, historic resources, and spiritual/sacred/Traditional Cultural Properties (TCPs).

- Prehistoric cultural resources are sites, structures, objects, or materials deposited or left behind prior to the entry of non-American Indian (European) explorers and settlers into an area. In this part of Wyoming, the prehistoric stage spanned from approximately 11,500 years BP to approximately 250 years BP.
- Historic cultural resources are sites, structures, objects, or materials deposited or left behind after the European presence was established.
- Spiritual/sacred/TCPs can include prehistoric or historic resources, structures, topographic features, habitats, plants, wildlife, and/or minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

The Prehistoric Stage

The Prehistoric Stage dates from at least 11,500 years BP to around 250 years BP. The Prehistoric Stage is characterized by a stable cultural phase in which the way of life appears to have changed little throughout the period. The peoples utilizing this region were hunters and gatherers who adapted their lifestyle to the high-plains environment and roamed the region in search of food and shelter. The movements of these nomadic peoples were generally determined by seasonal changes in resource availability. These peoples probably traveled mostly in small bands, spending only a limited amount of time in any one location. For the most part, the material goods of these groups were made from naturally available resources, including stone, wood, bone, pelts, sinew, and plant fibers.

Within the Prehistoric Stage, there are three broadly defined periods. The Paleoindian Period, from about 11,500 to 8,500 years BP, is the period for which the first evidence of humans in the region is found. The Paleoindian Period is characterized by big game hunting traditions utilizing typically well-made spear points. At the beginning of the period, the Paleoindians hunted animals that are now extinct, such as mammoth and giant bison, and used Clovis, Folsom, and Agate Basin projectile points, among others. As conditions became drier and warmer and as many of these Pleistocene species died out, Paleoindians had to adapt to hunting more modern species such as bison, deer, and mountain sheep. Paleoindian sites and artifacts are rarely found in the planning area.

The Archaic Period, from about 8,500 to 1,800 years BP, signals a shift to a wider use of available resources and less specialization. The climate had changed from an earlier wetter and cooler regime to dryer and hotter conditions. Projectile points changed in response to this shift, and generally became smaller through time. This period is broken down into the following divisions: the Great Divide Phase (8,500 to 6,000 years BP), the Opal Phase (6,200 to 3,700 years BP), the Pine Springs Phase (3,700 to 2,900 years BP), and the Deadman Wash Phase (2,900 to 1,800 years BP). The Opal Phase, with its housepits and reuse of site areas, is especially well represented in the planning area.

The Late Prehistoric Period, from about 1,800 to 250 years BP, begins with an apparent increase in population and a technological change signaled by the introduction of the bow and arrow. The Uinta Phase of this period (about 1,800 to 1,000 years BP) is characterized by Rose Springs projectile points and numerous short-term foraging and processing camps, sometimes with house-floor types of features. The Uinta is followed by the Firehole Phase (1,000 to 250 years BP). This phase is characterized by a sudden shift to small, tri-notched and side-notched projectile points, and a change in site types. Population densities also appear to have decreased in the Firehole Phase, and it is postulated that old and new cultural groups were moving and/or being displaced. Uinta Phase sites, with their cylindrical roasting pits and shallow floor features, are well represented in the planning area.

Because there are no written records for prehistoric resources, most of these types of resources are evaluated under NRHP Criterion D. That is, they are evaluated on their potential for information about the lifeways and practices of prehistoric peoples. Prehistoric resources can also be evaluated as spiritual or sacred properties or TCPs if they are thought to be important to specific modern cultural groups. Occasionally, prehistoric resources are evaluated under Criterion C if there are distinctive stylistic, artistic, or architectural components present. Loss of integrity for prehistoric resources can result from long-term deterioration or erosion, direct or indirect disruption by modern activities, or vandalism/looting.

Common cultural resources of the prehistoric stage include lithic scatters, stone circle habitations, petroglyphs and/or pictographs, open campsites, fire hearths or firepits, lithic quarries, and housepit habitations.

The Historic Stage

This stage is commonly considered to be the time for which there is written documentation of the events that occurred in the area. The Historic Stage is generally considered to have begun in the early 1800s, when there are records of the arrival of Euro-American explorers and traders into the region. Fur trappers, missionaries, emigrants, miners, ranchers, farmers, and merchants followed the explorers. The history of the lands within the planning area shares in many of the major themes in Western American history:

- Fur trade (1811 to 1840)
- Exploration (1811 to 1870s)
- Historic military (1830s to 1890s)
- Emigration (1840 to 1869)
- Historic mining (1867 to 1930s)
- Native American Reservation (1868 to present)
- Settlement (1870s to present)
- Ranching (1870s to present)
- Homesteading (1870s to 1930s)
- Expansion era, early commerce and industry (1880s to 1928)
- Historic oil and gas exploration (1884 to 1930s)
- Regional railroad (1906 to present)
- Irrigation ditches and districts (1880s to present)
- Automobile roads (1910s to present)
- Tie-hack industry (1880s to 1940s)
- The Great Depression (1929 to 1939)
- Modern mining and oil and gas exploration (1940s to present)

Highlights of Western American history specific to the planning area include the discovery of South Pass and a feasible overland route over the continental divide in 1812 and again in 1824; the great overland migrations on the Oregon, Mormon, and California Trails from 1840 to 1869; the mapping of the Oregon Trail by John C. Fremont in 1842; the creation of the Pony Express and the transcontinental telegraph line along the California Trail in the early 1860s; the founding of South Pass City, Atlantic City, and Miner's Delight during the South Pass gold rush of 1867 to 1872; the creation of the WRIR in 1868, and the later incorporation of Northern Arapahos into the reservation; the early settlement of the Lander Valley in the 1870s; the founding of the Sun Ranch in 1872, the first ranch in Sweetwater Valley; settlement of the Wind River Basin in the 1880s; the first oil well west of the Mississippi River, at Dallas Dome, in 1884; the founding of Riverton, Shoshoni, and Moneta and the railroad reaching those towns and Lander in 1906; the creation of the Riverton Irrigation Project in 1905/1906; establishment of the early Yellowstone National Park automobile tour routes in the 1910s and 1920s; the Hudson coal mining boom from 1907 to the 1920s; the tie-hack industry around Dubois and Riverton from 1907 to the 1940s; and the uranium boom in the Gas Hills, Crooks Gap, and Jeffrey City in the 1950s.

Historic resources can be evaluated under any of the NRHP criteria. Some historic resources can be associated with important historic events or persons (Criterion A and B), while others can contain important archeological information (Criterion D). Historic resources can also be evaluated under Criterion C if there are distinctive architectural or artistic components present. In rare instances, historic resources are evaluated as spiritual or sacred cultural properties if they are important to specific modern cultural groups. Loss of integrity for historic resources can result from deterioration or erosion, direct or indirect disruption by modern activities, or vandalism/looting.

The following historic cultural resources are commonly found in the planning area: ranching developments; trash scatters and dumps; mining prospects, developments, and mines; emigrant and stage trails, sites, and landmarks; livestock herder campsites; and abandoned homesteads.

Spiritual/Sacred/Traditional Cultural Resources and Properties

Spiritual, sacred, and traditional cultural resources and properties can be from both the prehistoric and historic phases. They include prehistoric or historic resources, structures, topographic features, habitats, plants, wildlife, and/or minerals that Native Americans or other groups consider essential for the preservation of traditional culture. These properties often are the sites of events important to a cultural group or sites of past or present spiritual/sacred practices. They might also be the locations of traditional practices, such as gathering plants for use in ceremonies. TCPs are understood to be eligible for listing on the NRHP as defined in the National Historic Preservation Act (NHPA), but other, non-eligible traditional use resources might be protected under the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA), or BLM policy. When addressing spiritual, sacred, or traditional cultural resources, more ephemeral indicators of condition can come into play. These types of properties can be considered significant to specific cultural groups, even if the integrity of the properties has been compromised. Indicators in these cases depend more on the cultural importance of a property, as defined by traditional elders or authorities.

Sacred sites might or might not be still used by the group, while spiritual sites and TCPs are still used by at least some members of the particular group. Sacred and spiritual sites and TCPs are not common, but do occur in the planning area. They usually have not been publicly identified, but some are known to the BLM and are protected in a discreet manner. The location of most of these sites is kept undisclosed because of their vulnerability to looting or vandalism, and because the groups have requested they remain unidentified. Rock figures and unusual shapes, burials, medicine wheels, and vision-quest sites are examples of these kinds of sites. Martin's Cove, a site sacred to the Church of Jesus Christ of Latter-Day Saints, could also be considered a TCP. The conditions of these types of properties can range from good to poor.

Sacred and spiritual sites and TCPs derive their significance from their importance to specific modern cultural groups, such as Native American tribes or religious groups. The BLM relies on traditional elders or authorities from these groups to help evaluate the importance and condition of the properties.

The following resource or property types, found in the planning area, might have spiritual, sacred, and/or traditional values: burials; battlefields; medicine wheels; sun dance locations; prayer circles and lodges; sweat lodges; and altars, cairns, and rock alignments. When these types of resources are found, traditional elders or authorities are consulted to determine if they are considered spiritual, sacred, or traditional properties, and if they qualify as TCPs.

Resources Requiring Special Management

This section highlights those resources and resource types in the planning area that require special management beyond that mandated in the NHPA. Table 3.44, "Selected Cultural Resource Sites and NRHP Status in the Planning Area" (p. 431) lists these cultural resources, which are sensitive or significant enough that standard NHPA regulations are not adequate for their management. These resources require proactive management to maintain the qualities that make them significant (see Map 69 for locations of these resources).

Table 3.44. Selected Cultural Resource Sites and NRHP Status in the Planning Area

Resource Name	Type	Designation Status	Location of Resource	Section of Affected Environment Chapter Where Site is Discussed
1. Castle Gardens Petroglyph/Pictograph Site	Prehistoric Rock Art Site	Listed on the NRHP	Eastern Fremont County near the Gas Hills	Cultural Resources – Prehistoric Resources and Areas of Critical Environmental Concern – Proposed ACECs
2. Oregon, Mormon Pioneer, California, and Pony Express National Historic Trails	Historic Emigrant Trails	Congressionally Designated National Historic Trails; also an existing ACEC	Along the Sweetwater River, from near Independence Rock to Burnt Ranch, south of Atlantic City	Congressionally Designated Trails – National Historic Trails
• Martin's Cove	Historic Emigrant Site	Listed on the NRHP	Southwestern Natrona County	Congressionally Designated Trails – National Historic Trails
• Devil's Gate	Historic Emigrant Site	Part of a National Historic Landmark	Southwestern Natrona County	Congressionally Designated Trails – National Historic Trails
• Split Rock	Historic Emigrant Site	Listed on the NRHP	Southwestern Natrona County	Congressionally Designated Trails – National Historic Trails
• Ice Slough	Historic Emigrant Site	Considered eligible for the NRHP	Southcentral Fremont County	Congressionally Designated Trails – National Historic Trails
• Rocky Ridge	Historic Emigrant Site	Considered eligible for the NRHP	Southwestern Fremont County	Congressionally Designated Trails – National Historic Trails
• Rock Creek Hollow	Historic Emigrant Site	Considered eligible for the NRHP	Southwestern Fremont County	Congressionally Designated Trails – National Historic Trails
• Gilespeie Place	Historic Emigrant Site	Considered eligible for the NRHP	Southwestern Fremont County	Congressionally Designated Trails – National Historic Trails
3. Warm Springs Canyon Flume, Natural Bridge, and Geyser	Historic Tie Flume and natural features	Considered eligible for the NRHP	Northwestern Fremont County near Dubois	Cultural Resources – Historic Resources

Resource Name	Type	Designation Status	Location of Resource	Section of Affected Environment Chapter Where Site is Discussed
4. South Pass Historic Mining Area	Historic Gold Mining District, with mines, settlements, and military outposts	Miner's Delight and South Pass City listed on the NRHP; the entire historic mining area and several sites within it are NRHP eligible	Southwestern Fremont County, on the southern edge of the Wind River Mountains	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Existing ACECs With Proposed Expansions
• Miner's Delight	Historic Mining-Related Site	Listed on the NRHP	Southwestern Fremont County, on the southern edge of the Wind River Mountains	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Existing ACECs With Proposed Expansions
• South Pass City	Historic Mining-Related Site	Listed on the NRHP	Southwestern Fremont County, on the southern edge of the Wind River Mountains	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Existing ACECs With Proposed Expansions
5. Regionally Significant Historic Trails	Historic Wagon Trail	Considered eligible for the NRHP	Northeastern Fremont County near Lost Cabin	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs
• Bridger Trail				
• Rawlins to Fort Washakie Stage Trail	Historic Wagon Trail	Considered eligible for the NRHP	South of Green Mountain to Lander	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs
• Casper to Lander Road	Historic Wagon Trail	Considered eligible for the NRHP	Eastern Fremont County, near Deer Creek to near Alkali Butte	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs
• Point of Rocks to South Pass Stage Road	Historic Wagon Trail	Considered eligible for the NRHP	Southwestern Fremont County, from Burnt Ranch to South Pass City	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs

Resource Name	Type	Designation Status	Location of Resource	Section of Affected Environment Chapter Where Site is Discussed
<ul style="list-style-type: none"> Green River to South Pass to Fort Washakie Stage Trail 	Historic Wagon Trail	Considered eligible for the NRHP	Southwestern Fremont County, from South Pass City to Lander	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs
<ul style="list-style-type: none"> Birdseye Pass Stage Trail 	Historic Wagon Trail	Considered eligible for the NRHP	Northeastern Fremont County, near Wind River Canyon	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs
6. Regionally Significant Historic Highways <ul style="list-style-type: none"> Yellowstone/ National Park to Park Highway 	Historic Auto Highway	Considered eligible for the NRHP	Northeastern Fremont County, from east of Moneta to Shoshoni	Cultural Resources – Historic Resources and Areas of Critical Environmental Concern – Proposed ACECs
7. Cedar Ridge Traditional Cultural Property	Prehistoric - Historic, sacred Traditional Cultural Property	Considered eligible for the NRHP	Northeastern Fremont County near Lost Cabin	Cultural Resources – Native American Spiritual, Sacred and Traditional Resources and Areas of Critical Environmental Concern – Proposed ACECs
Sources: BLM 2009a, BLM 2012a ACEC Area of Critical Environmental Concern BLM Bureau of Land Management NHT National Historic Trail NRHP National Register of Historic Places				

Prehistoric Era Resources Requiring Special Management

Castle Gardens Petroglyph/Pictograph Area

The Castle Gardens Petroglyph/Pictograph site is a well-known rock art area in the eastern part of the planning area. The site contains a large number of prehistoric drawings etched in and/or painted on sandstone. The rock art is recognized as some of the best in the Wyoming region, and has become well known in the Northwestern Plains. Several styles of art are evident, and many excellent shield motif representations are present. The prehistoric rock art is estimated to date from the Late Prehistoric Period (about 1,800 to 250 years BP), and the functions of the drawings are assumed to be mostly concerned with spiritual beliefs or a record of important events. The rock art can be found over a large portion of the Castle Gardens uplifted area, which covers an area 6 miles long by 1 mile wide. The majority of the rock art is, however, located at the far eastern end of the Castle Gardens area. The site is considered to be a spiritual site to the Eastern

Shoshone, Northern Arapaho, and other tribes and modern traditional use of the site has been documented as well.

The Castle Gardens Petroglyph/Pictograph site was first recorded in the early 1940s (Sowers 1941). Since then, it has become well known to the general public, and the rock art has suffered from vandalism and weathering. In the 1970s, the BLM constructed a road into the site. At that time, it was thought that increased access and fencing would slow the damage, and a road, parking lot, toilets, picnic tables, fences around panels, and signs were installed. However, instead of decreasing the vandalism, the development caused it to increase. Today the site is damaged but retains much of its character and spiritual value.

The Castle Gardens Rock Art Site is listed on the NRHP and is managed for cultural and recreational values. The immediate site vicinity is protected from oil and gas development, locatable mineral exploration (segregated from mining), grazing (fenced enclosure), and is closed to motorized travel. Castle Gardens has been nominated for ACEC designation.

Historic Era Resources Requiring Special Management

Congressionally Designated Trails

The *Congressionally Designated Trails* section discusses the CDNST and the Oregon, Mormon Pioneer, California, and Pony Express NHTs.

Warm Springs Canyon Flume, Natural Bridge, and Geyser

The Warm Springs Canyon Flume, Natural Bridge, and geyser are in a unique historical and natural area on the lower slopes of the northern Wind River Mountains near Dubois. The natural and historical elements of this area are closely related, and management must consider both aspects.

The historical element is a flume that runs down Warm Springs Canyon. In the 1920s, there were no adequate haul roads; instead, the Warm Springs Canyon Flume was built to transport hand-hewn railroad ties down to the Wind River. Once on the Wind River, the ties were floated downstream to a processing plant in Riverton, where railroad companies picked them up for use on the many railroad lines in the region. The flume, completed in 1928, was part of an early system of railroad-tie procurement that relied on few machines. Instead, mountain camps were established, and woodcutters hewed the ties from trees, mostly by hand. The flume spanned nine steep, twisting miles and was often suspended on the walls of the canyon because of the stream's narrow course. The flume utilized water to run the ties down to the Wind River and during its active life carried hundreds of thousands of ties out of the mountains. The flume was abandoned in 1942, when a haul road was completed and trucks became a more economical way to transport the ties (Pinkerton 1981).

The natural element of this resource lies on BLM-administered land near the lower end of Warm Springs Canyon. It is here that the flume crosses the "Natural Bridge." This natural bridge is a limestone cavity through which Warm Springs Creek flows. The flume was built through the natural bridge and is suspended on its walls. Another nearby natural phenomenon unique to the area is an inactive geyser, which lies just above the canyon. This geyser resembles a warm spring situated deep inside the old geyser pipe.

Weather and landslides have deteriorated portions of the flume on BLM-administered lands. Despite these ongoing processes, some of the flume is still in good condition, and the segment

within the natural bridge has been shielded and remains in good condition. The inactive geyser has some modern trash around it but is otherwise in good condition. Limited access to the area has probably deterred much damage to the area's features, and this would probably continue to be the situation in the future.

The Warm Springs Canyon Flume site is managed for historical and natural values. The site is protected from oil and gas development (NSO) and from other uses incompatible with its historic qualities. The Warm Springs Canyon Flume was recommended in the existing Lander RMP to be withdrawn from locatable mineral entry; however, the withdrawal has not been completed. Though the site was the subject of an engineering and stabilization study, the management plan and stabilization has not been completed. Warm Springs Canyon Flume has been nominated for ACEC designation.

Most of the original flume was on USFS-managed land. A small part near the lower end of the flume's course lies on BLM-administered and private land. The natural bridge and geyser are on BLM-administered lands. The Warm Springs Flume, Natural Bridge, and geyser area are considered eligible for listing on the NRHP, but no formal nomination procedures have been completed for this site.

South Pass Historic Mining District and Associated Features

This area consists of approximately 12,576 acres of BLM-administered surface encompassing a historic gold mining region southwest of Lander on the southern end of the Wind River Mountains, and is protected as an ACEC. It is discussed here because of its relevance to the history of the area. Characterized by both sagebrush steppe and forested areas with steep to rolling hills, the area contains important historic resources and geological hazards resulting from mining activities. South Pass was and is the largest gold mining area in Wyoming. The influences of this marginal gold mining area on the early development of the Wyoming Territory and the State of Wyoming were considerable.

South Pass Historic Mining Area

A trapper with the American Fur Company first discovered gold in the South Pass area in 1842. This was followed by limited prospecting in the 1850s and early 1860s, but no organized operations were established because of Indian hostilities and/or unprofitable diggings. It was not until 1867 that large numbers of prospectors entered this area, which was known at that time as the "Sweetwater Mines" area. The year 1867 was notable for the discovery of most of the major gold deposits in the area, including the Carrissa, Miner's Delight, and King Solomon Lodes. By 1868, up to 1,000 people might have lived in the area, and the towns of South Pass City, Atlantic City, and Miner's Delight were established. However, the mining boom died quickly, and by 1872 the original gold prospects were played out and the area (including the towns) became almost deserted. There were recurrent periods of gold mining activity in the South Pass region in the 1880s, from 1907 to 1911, and in the 1930s, but the efforts were never very profitable.

Although the mining activities proved short-lived and mostly unprofitable, development in the South Pass region resulted in social and cultural impacts to Wyoming. The South Pass towns were some of the first permanent European settlements and generated a new economic base. The economic stimuli from mining operations also encouraged growth of the regional economy.

Freighting companies, merchants, and speculators benefited from the import of equipment and the sales of basic supplies, land, and claims. Stagecoach lines also sprang up to carry people, goods,

and mail to and from the mining area market. The increased economic activity affected markets as far away as Salt Lake City and Denver. Settlement of the Wind River Basin and development of Lander Valley's economy were also highly influenced by the South Pass mining activity. The first settlers in the Lander area came mainly from the South Pass settlements, and the early farming communities in the valleys were able to rely on the mining area markets for much of their livelihoods. The mining settlements also provided added impetus to the coming cattle industry by contributing capital and markets for some of the first cattle ranching outfits in the state.

Along with the mining industry came early military and transportation endeavors. Camp Stambaugh, built in 1870, was an army post constructed near Atlantic City to offer protection to the miners and other settlers from hostile Indians. Occupied until 1877, the camp was not involved in hostilities; instead, it became an important supply station for the local area.

Stagecoach lines sprang up to serve the needs of the miners and bring new people into the area. Stage roads from the Green River, Point of Rocks, and Lander all went through the South Pass area. They continued to provide an important service until the early 1900s.

The South Pass settlements have survived up to the present by supporting limited gold mining operations, cattle and sheep grazing, small commercial concerns, and recent iron-ore extraction operations. In the 1960s and 1970s, historical interest in the area sparked a movement to preserve the old towns and mines. Some of the more important sites in the South Pass Historic Mining District were stabilized or reconstructed. At present, the area has several historical sites that visitors frequent, but several others are deteriorating due to weathering and lack of care.

Weathering, collection, and occasional vandalism are deteriorating the South Pass Historic Mining Area. Some of the more important sites in the district were stabilized or reconstructed. At present, the area has several historic sites that attract visitors, but others are suffering from weathering degradation. The same is true for Miner's Delight, where stabilization efforts have slowed deterioration to some extent but not stopped the effects of weathering and vandalism. In contrast, South Pass City is stable or improving, because coordination with the State of Wyoming has resulted in improved management and stewardship of the historic site.

Without additional stabilization efforts at certain sites in the South Pass Historic Mining Area, standing structures would eventually be lost as they deteriorate beyond repair. As physical degradation continues and requires more effort and funding to reverse, the necessary efforts to stabilize and restore these resources would continue to increase. Looting and vandalism would also continue to affect sites in the historic mining area unless they are controlled.

The South Pass Historic Mining Area is eligible for listing on the NRHP and is managed as an ACEC for cultural and recreational values. The area has an NSO restriction on mineral leasing; is segregated from locatable mineral exploration (requires a Plan of Operations); is an avoidance area for utility ROWs; and motorized travel is limited.

Miner's Delight Townsite

Miner's Delight Townsite is a historic site associated with the South Pass Historic Mining Area. Established in 1868, it was one of the three original towns that sprang up in the initial gold rush at the south end of the Wind River Mountain Range. Despite several small booms (followed by busts), the town never became established and lingered on with only a few residents into the 1930s. By the 1960s, the townsite was abandoned and falling into disrepair. In the 1980s,

there were limited stabilization efforts, and today the site is in fair condition; the BLM manages the site as a “ghost town.”

Miner’s Delight is listed on the NRHP. Approximately 100 acres of this site are on BLM-administered surface and are managed for historical and recreational values. The site is protected from oil and gas development (NSO), locatable mineral exploration (segregated from mining), major utility systems, and from other uses incompatible with its historic qualities. A cultural resources management plan was developed and approved for Miner’s Delight; some fencing, historic surveys, structural stabilization, protection, and archeological excavations have been performed at the site, but further work is needed at the site to maintain and protect it.

South Pass City

A success story for cultural resources in the planning area is South Pass City, another historic site associated with the South Pass Historic Mining Area and in the ACEC. About 8 miles southwest of Miner’s Delight, South Pass City was the original settlement when the gold rush occurred and was the largest town in the original mining district. South Pass City also experienced booms and busts and was mostly abandoned by the middle of the 20th Century.

Local interest in the town’s preservation eventually resulted in the State of Wyoming purchasing some of the town. With substantial funding, historic buildings were reconstructed and the site was developed as a heritage tourism destination. Additional historic structures from the old town site were on BLM-administered surface and leased to the State of Wyoming to enhance its historic preservation efforts. At present, the Wyoming Department of State Parks and Cultural Resources manages the site to portray life in an early mining town. Recently, the BLM-administered surface lands have been transferred to the state for consolidation with its state park for improved management. The BLM may consider additional transfers to the state in the future.

Regionally Significant Historic Trails and Early Highways (excluding National Historic Trails)

Regionally significant historic trails and early highways are historic era resources requiring special management in the planning area. This section discusses NRHP eligible linear transportation features in the planning area that are not part of the National Trails System. The *Congressionally Designated Trails* section discusses the CDNST and the Oregon, Mormon Pioneer, California, and Pony Express NHTs.

There are a number of regionally significant historic trails and early highways in the planning area (Map 69). These linear resources were important in the early development of Wyoming and Montana, and include the Bridger Trail, the Rawlins-Fort Washakie Stage Trail, the Casper to Lander Stage Road, the Point of Rocks to South Pass to Lander Stage Trail, the Birdseye Pass Stage Trail, the Green River to South Pass to Fort Washakie Stage Trail, and the Yellowstone/National Park to Park Highway. All have been determined eligible for listing on the NRHP and all have been nominated for ACEC designation and proposed as a single regional trails ACEC. To some extent, all these routes are eligible for listing on the NRHP based on their association with events important to understanding American history on either the national or local level, links to historically significant people, and their potential to yield information important to history.

A historic trail can be vulnerable and fragile if its qualities of integrity are easily threatened. One of the qualities of integrity for a historic trail can be its setting. The term “setting” comes

from criteria developed and commonly used for the NRHP. As defined by the NPS, setting is the physical environment of a historic property. Setting refers to the *character* of the place in which the property played its historical role. It involves *how*, not just *where*, the property is situated and its relationship to surrounding features and open space. The physical features that constitute the setting of a historic property can be either natural or man-made, including such elements as topographic features (a gorge or the crest of a hill); vegetation; simple man-made features (paths or fences); and relationships between buildings and other features or open space. These features and their relationships should be examined not only within the exact boundaries of the property, but also between the property and its *surroundings*. This is particularly important for districts and landscapes.

Both the BLM and State Historic Preservation Office (SHPO) evaluate historic trails for the integrity of their historic settings. When a historic trail or early highway has an intact historical setting, that setting becomes an important aspect of its integrity. Modern impacts and disturbances can threaten a historic trail's setting by introducing elements that are out of character with that setting. For example, a visible oil well pad, tank, wellhead, or pump jack could adversely affect the intact historic setting of the Rawlins-Fort Washakie Stage Trail by introducing elements that were not part of the landscape when the trail was being used as a stage trail. Those intrusions would degrade the integrity of the trail and could permanently degrade the NRHP-eligible qualities of the trail to the point where that segment of trail would have to be determined not eligible for listing on the NRHP.

Although the regional historic trails and early highways have not been as intensively studied as the NHTs, much is known about their conditions and settings. Map 79 shows the remaining intact segments of each regionally significant historic trail or early highway; however, in some cases the historic settings have not been analyzed.

Regionally Significant Historic Trails

Bridger Trail

The Bridger Trail is a historic wagon trail that connected the Oregon Trail near Casper to the Montana gold fields. This trail passes through the northeastern portion of the planning area, and runs from the southeast past Lost Cabin and up over the Bridger Mountain Range near Bridger Pass. Jim Bridger blazed this regionally significant historic trail in 1864 as an alternative to the Bozeman Trail. It later became an important route for settlers headed for the Bighorn Basin. After the railroad arrived in the early 1900s, this trail became a local access route, and its intact historic setting remained for the next 50 years.

The physical condition and historical settings of the Bridger Trail have been analyzed over its entire length in Fremont County. Nine segments totaling 13.5 miles (49 percent) were determined to be Contributing to its NRHP eligibility, and 10 segments totaling 9 miles (32 percent) were determined to be Non-Contributing. One segment of 5.3 miles (19 percent) has not yet been evaluated. BLM and SHPO have agreed on these determinations.

Because the Bridger Trail's location had not been specifically identified, oil and gas activities were allowed to affect the trail in the 1970s, 1980s, and 1990s. Once the trail's location was clarified, protection measures began. Recently, oil and gas activity has increased around the trail; at the same time, protection measures have been instituted that are designed to help protect its historical character. Most of the trail through the planning area is still visible as a single set of ruts

or as a swale. Because of increased oil and gas activity in the last 15 years, the Bridger Trail's condition trend is down. More recent mitigation measures have slowed the rate of intrusions.

Rawlins-Fort Washakie Stage Trail

The Rawlins-Fort Washakie Stage Trail connected the transcontinental railroad at Rawlins with the new settlements of Fort Washakie and Lander. This trail was established in the 1870s and was a major transportation link until 1906, when the railroad reached Lander. Used by freighters, stagecoaches, and the military, this route was an important early link to the outside world for the Sweetwater Valley, the South Pass Mines, and the Lander Valley.

The physical condition and historical settings of the trail have been analyzed over a good portion of southern Fremont County. At present, the trail ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and some parts of the trail have been completely obliterated. About two-thirds of the original trail is still visible as one or more ruts or as one or more swales. Seven segments of approximately 40 miles (55 percent) were determined to be Contributing to its NRHP eligibility, and 8 segments totaling approximately 24 miles (33 percent) were determined to be Non-Contributing. Two segments of 9 miles (12 percent) have not yet been evaluated. BLM and SHPO have agreed on most of these determinations; however, some of the data are outdated and needs to be updated. The condition trend is slowly down. Occasional oil and gas development and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue.

Casper to Lander Road

The Casper to Lander Road became an important transportation artery between Casper and the Lander Valley after the railroad arrived in Casper in the 1880s. It, too, lasted until the railroad reached Shoshoni, Riverton, and Lander in 1906. It was a freight and stagecoach route and an important part of the development of the Wind River Basin.

The physical condition and historical settings of the Casper to Lander Road (both routes) have been analyzed in a piecemeal fashion, and data on this road are based on aerial photography where ground studies have not been performed. At present, the road ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and some parts have been completely obliterated. Approximately 59 miles (77 percent) of trail are still visible as a single set of ruts or as a swale with good historical settings. However, approximately 18 miles (23 percent) of the trail has been affected and are likely to be Non-Contributing to its NRHP eligibility. The condition trend is slowly down. Occasional development and ROWs have threatened the trail over the last 25 years; this trend is expected to continue, although mitigation measures have slowed the rate of intrusions.

Point of Rocks to South Pass to Lander Stage Trail

The Point of Rocks to South Pass to Lander Stage Trail was a supply route for the South Pass area mines in the 1870s. This transportation corridor was an important link for the entrepreneurs developing the South Pass mining area, but was supplanted when a main rail depot was established at Green River.

The physical condition and historical settings of this trail have been analyzed in southwestern Fremont County. At present, the trail ranges from slightly-to-moderately damaged by modern intrusions, and some parts of the trail have been completely obliterated. One segment of approximately 5 miles has intact ruts and good historical settings. The condition trend is very

slowly down. Developments and ROWs have threatened the trail over the last 25 years, and this trend is expected to continue. Part of the Point of Rocks to South Pass to Lander Trail is in the South Pass Historic Mining Area ACEC.

Green River to South Pass to Fort Washakie Stage Trail

The Green River to South Pass to Fort Washakie Stage Trail was an important trail from the railroad at Green River to the mines at South Pass and the Lander Valley. It began in the 1870s and was used until 1906, when the railroad reached Lander. Together with the Rawlins-Fort Washakie Stage Trail, this was the major supply route into the South Pass and Lander areas for several decades.

The physical condition and historical settings of the trail have been analyzed in southwestern Fremont County. At present, the trail ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and some parts of the trail have been obliterated. One segment of approximately 12 miles has intact ruts and good historical settings. The condition trend is slowly down. Occasional development and ROWs have threatened the trail over the last 25 years; this trend is expected to continue, although mitigation measures have slowed the rate of intrusions. Parts of the Green River to South Pass to Fort Washakie Stage Trail pass through the South Pass Historic Mining Area and Red Canyon ACECs. The trail itself has been nominated for ACEC designation.

Birdseye Pass Stage Trail

The Birdseye Pass Stage Trail connected the Wind River Basin to the Bighorn Basin in the late 1800s. It was the main route from the Lander and Riverton areas to Thermopolis and points farther north until the early 1900s, when the railroad reached Worland.

The physical condition and historical settings of this trail have been analyzed in northern Fremont County. At present, the trail ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and major parts of the trail through the planning area have been obliterated. Two segments of approximately 7 miles have intact ruts and good historical settings. The condition trend is slowly down. Occasional development and ROWs have threatened the trail over the last 25 years. This trend is expected to continue, although mitigation measures have slowed the rate of intrusions.

Early Highways

Yellowstone/National Park to Park Highway

The Yellowstone/National Park to Park Highway is an early auto road in central Wyoming. It was publicized as a road system that connected National Parks all over the western United States. Local towns attempted to generate tourist income from automobile tourists through improved roads and advertisements, claiming that this route was the best way to Yellowstone and Rocky Mountain National Parks. The Yellowstone/National Park to Park Highway was used in the 1910s and 1920s until Wyoming State Highways supplanted it as a tourist route.

The physical condition and historical settings of the highway have been analyzed for most of its length in northern Fremont County. At present, the highway ranges from slightly-to-moderately-to-severely damaged by modern intrusions, and major parts of the highway through the planning area have been completely obliterated. Six segments totaling 16.3 miles (80 percent) were determined to be Contributing to its NRHP eligibility, and 4 segments of 4.2 miles (20 percent)

were determined to be Non-Contributing. BLM and SHPO have agreed on these determinations. The condition trend is down. Oil and gas development and ROWs have dramatically increased effects to this early automobile road over the last 25 years; this trend is expected to continue, although mitigation measures have slowed the rate of intrusions.

Native American Spiritual, Sacred, and Traditional Resources

There are a few Native American spiritual, sacred, or TCPs in the planning area and these are being managed for their corresponding values. The sites are protected on a case-by-case basis from oil and gas development (NSO) and from other uses incompatible with their special qualities. Sites that might also have cultural, traditional, or sacred importance include rock art and rock alignments, including medicine wheels, burials, and vision quest sites. Cairns, habitations, rock shelters, and caves might also have special importance to Native Americans.

Cedar Ridge Complex

Cedar Ridge Complex is a specific spiritual/sacred/TCP in the northeastern portion of the planning area. Most of Cedar Ridge lies within the BLM Casper Field Office planning area to the east, but its western limits extend into the Lander Field Office planning area. Cedar Ridge is protected by special management in the Casper Field Office RMP. In the Lander planning area, Cedar Ridge is not part of any existing ACEC, but it has been nominated and proposed as an ACEC.

Cedar Ridge was used for more than 5,500 years as a ceremonial site for prayers and rituals and continues to be a sacred place for Eastern Shoshone to conduct religious observances. The site is considered integral to the proper functioning of contemporary Shoshone ways of life, a right that is specified in Executive Order 13007, Indian Sacred Sites (May 24, 1996), and AIRFA. The part of the ridge in the planning area has not experienced much modern development. The Cedar Ridge complex is also culturally important to the Crow and possibly other tribes. It was established as a TCP in 1997 after extensive consultation with the Eastern Shoshone and the Wyoming SHPO.

Other Sacred Sites

There are other sacred sites within the planning area in addition to Cedar Ridge. They are occasionally discovered and are protected as required by laws, regulation, and Executive Orders. The sensitivity of these sites precludes disclosure of their locations.

Resource Management

Cultural Resources Significance

Cultural resources are evaluated in the context of eligibility for listing on the NRHP. Eligibility is based on whether the resource meets the criteria for evaluation as defined by the NHPA (36 CFR Part 60.4). For NHPA purposes, cultural resources, including both prehistoric- and historic-era sites, that meet one or more of these criteria are called historic properties. The criteria as identified in the NHPA are:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association; and

- (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) that are associated with the lives of persons significant in our past; or
- (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- (d) that have yielded, or may be likely to yield, information important in prehistory or history.

Cultural resources might also have status under a number of other legislative and regulatory standards, or as conferred by a specific religious or cultural group.

Identified Cultural Resources

File search inventories (Class I) and intensive field inventories (Class III) have been conducted for BLM sponsored or sanctioned projects since about 1975. Inventories within the planning area have primarily been related to oil and gas exploration and development, utility ROWs, and mining.

The Lander Field Office maintains a file of known cultural resources with records dating back to 1948. The data have been gathered from various sources, including universities, archeological and historical contractors, local informants and sources, the BLM and state government agencies, and historical accounts. The files include information about many types of prehistoric and historic cultural resources. Table 3.45, “Cultural Resource Statistics for the Planning Area” (p. 442) briefly describes those resources.

Table 3.45. Cultural Resource Statistics for the Planning Area

Total Acreage of Class III Inventories	Total Documented Cultural Resource Sites	Total Number of Sites Listed on or Eligible for the NRHP	Total Number of Sites Not Eligible for the NRHP	Total Number of Sites of Undetermined Eligibility for the NRHP
179,000 Acres	5,486 Sites	885 Eligible Sites	2,397 Ineligible Sites	2,204 Undetermined Sites
Source: BLM 2010c				
NRHP National Register of Historic Places				

BLM Cultural Resources Management

The BLM is legally mandated to identify, evaluate, and manage cultural resources under at least 10 federal laws and four Presidential Executive Orders, most prominently the Antiquities Act of 1906, the NHPA of 1966, the NEPA of 1969, the FLPMA of 1976, as amended, and Executive Order 11593, Protection and Enhancement of the Cultural Environment (1971). BLM policy and cultural resource program guidance are outlined in BLM Manuals 8100, 8110, 8120, and 8130. The BLM approach to managing NHTs was detailed in 1986 in the *Oregon/Mormon Pioneer National Historic Trails Management Plan*. The *Congressionally Designated Trails* section discusses the Oregon, Mormon Pioneer, California, and Pony Express NHTs, but the same principles can be applied to management of regionally significant historic trails, in accordance

with Appendix IV of the plan (BLM 1986), which addresses overall concerns and management issues. The BLM intends to revise the plan to meet current preservation needs.

In 1997, the BLM developed an agreement to address the means of complying with NHPA, expressed in the *Programmatic Agreement Among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which BLM will meet its Responsibilities Under the National Historic Preservation Act* (BLM 1997c). Pursuant to this national Programmatic Agreement, the BLM Wyoming State Office developed a specific process by which NHPA compliance is accomplished, detailed in the *State Protocol Agreement Between the Wyoming BLM State Director and the Wyoming State Historic Preservation Officer* (BLM 2006). Apart from certain considerations derived from specific cultural resource statutes, management of cultural resources on public lands is primarily based on FLPMA, and is fully subject to the same multiple-use principles and the same planning and decision-making processes applied to managing other public land resources.

Specific objectives for cultural resource management are expressed in BLM Manual 8130, Planning for Uses of Cultural Resources (incorporating Information Bulletin No. 2002-101, Cultural Resource Considerations in RMPs), which states that all RMPs will include at least the following goals:

- Preserve and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations. This goal requires use allocation decisions in the RMP, in which all cultural properties in the planning area must be allocated to the following uses according to their nature and relative preservation value: Scientific Use – preserved until research potential is realized; Conservation for Future Use – preserved until conditions for use are met; Traditional Use – long-term preservation; Public Use – long-term preservation and onsite interpretation; Experimental Use – protected until used; and Discharged from Management – no use after recordation and not preserved.
- Seek to reduce imminent threats from natural or human-caused deterioration or potential conflict with other resource uses by identifying priority geographic areas for new field inventory, based upon a probability for unrecorded significant resources. This goal requires a Class I regional overview of the planning area to identify priority areas in need of new field inventory where unrecorded significant resources could be found.

Use Categories

BLM Manual 8110, Identifying Cultural Resources, defines six use categories: scientific use, conservation for future use, traditional use, public use, experimental use, and discharged from management. “A cultural property may be allocated to more than one use category. Allocations should be reevaluated and revised, as needed, when circumstances change or new data become available” (BLM 2004d).

Scientific Use

Scientific use implies that the value of the property lies in information that can be extracted from the property. This use category usually corresponds to NRHP Criterion D, which recognizes the value to society of properties that can yield or have yielded information important to expanding understanding of history or prehistory. Archeological sites are generally evaluated under this criterion, although other kinds of cultural resources can also be evaluated under this criterion.

NRHP Criterion D eligibility is the regulatory threshold for management of a cultural resource for its scientific values; management opportunities include in situ preservation and protection, or extraction of the scientific information by means of excavation and analysis.

Conservation for Future Use

BLM Manual 8110 defines conservation for future use as “reserved for any unusual cultural property which, because of scarcity, a research potential that surpasses the current state of the art, singular historic importance, cultural importance, architectural interest, or comparable reasons, is not currently available for consideration as the subject of scientific or historical study that would result in its physical alteration.” This use category pertains to all cultural resources regardless of age or thematic associations, unless the resources have been formally determined to be ineligible for listing on the NRHP under all of the NRHP criteria for evaluation. Sites that might be of scientific value but are not immediate candidates for study under the scientific use category are managed under the conservation for future use category. The Lander Field Office cannot feasibly perform site testing for all archeological sites and otherwise evaluate the NRHP eligibility of all of the recorded cultural resources in the planning area. Therefore, conservation for future use involves monitoring of other public land uses, evaluation of specific proposed activities that might disturb specific cultural resources, erosion control of the resources, and active stabilization of the resources as appropriate.

Traditional Use

Traditional use of cultural resources is the use of the cultural resource itself, rather than uses of a property that do not rely directly on the existence of the cultural resource. Cultural resources can include TCPs, which are properties that are critical to a living community’s beliefs, customs, and practices. The regulatory threshold for management of a property as a TCP is eligibility for listing on the NRHP under any of the criteria for evaluation, although Criterion A is the most commonly appropriate for representation of an event or broad pattern in history. Cedar Ridge Complex is the only explicitly identified TCP as defined in NRHP Bulletin 38 (Parker and King 1998). However, rock art localities throughout the planning area are candidates for the traditional use category.

Public Use

Long-term preservation and onsite interpretation are most appropriate for cultural resources that have visually obvious manifestations of the site’s historical or archeological importance. This resource type is represented by rock art occurrences in the planning area. The intent of interpretive efforts is that education will help preserve the site and similar examples.

All BLM-administered surface lands are managed in the public interest and there is no distinct regulatory threshold for management of cultural resources through long-term preservation and onsite interpretation. Considerations for management in this manner are: (1) the relative significance of the resource within historical, archeological, or other cultural context(s), (2) the sensitivity of the cultural resource to loss or degradation as a result of increased public access, and (3) the ability of the BLM to install and maintain interpretive features and support facilities while protecting the cultural values of the site. Management under this use category is therefore driven more by practical considerations than by regulatory requirements. Onsite interpretation is also not appropriate for most Native American TCPs because of the possible degrading effects of public presence on the setting and feeling of these locations.

Experimental Use

Experimental use is rarely appropriate for cultural resources because of the singular, nonrenewable, and typically fragile nature of the resource. However, certain archeological sites, particularly rock shelters that contain well-defined stratified deposits might be appropriate for management under this use category. The regulatory threshold for management of cultural resources for experimental use is likely to be eligible under NRHP Criterion D, which involves the likelihood of yielding information important to expanding knowledge of history or prehistory. Archeological sites that could be adversely affected by development or other factors might also be candidates for experimental use as mitigation for adverse effects.

Discharged from Management

This use category applies to any cultural resource that the BLM and the Wyoming SHPO have determined to be ineligible for nomination to the NRHP. Sites placed in this use category “remain in the inventory, but they are removed from further management attention and do not constrain other land uses” (BLM 2004d).

Management Challenges for Cultural Resources

Prehistoric Resources

As a nonrenewable resource, cultural resources in general and prehistoric resources in particular are vulnerable to effects from use and other management actions. While the protection of cultural resources has some of the strongest regulatory basis of any of the multiple uses, increasing development, particularly oil, gas, and mineral extraction and ROW development, presents a long-term threat to the resources. Over the last 20 years, effects from development to prehistoric resources have increased in the planning area. Undiscovered buried sites are especially vulnerable to destruction during construction. Increased awareness of the potential for buried resources and improved data recovery measures have increased the knowledge of the prehistoric resources present in the planning area. Consultation prior to development and avoidance are the best management approaches.

Natural impacts to prehistoric cultural resources from weather and exposure amplify effects related to development or other management actions and public use. Within the last two decades, public knowledge of the existence and location of cultural resources has increased, while management techniques necessary to protect the resources for the future are still being developed.

Collecting, looting, and vandalism of prehistoric sites have been and continue to be serious problems and have contributed to the deterioration of sites through the loss of scientific information and effects on site integrity and context. Certain types of sites, such as rock art and historic structures have been seriously damaged from these kinds of activities. For example, Castle Gardens continues to deteriorate despite attempts to protect it. Vandalism is an ongoing problem that threatens the site, as does erosion. Vandalism has not abated, partially because the site has not been actively managed. Development and implementation of a carefully developed management plan is essential to reverse this trend. Recent analysis of the Castle Gardens site by a conservation expert will provide insight to managing this property in the future (BLM 2009a).

Historic Resources

As with prehistoric resources, increasing development presents a long-term threat to historic cultural resources. However, historic resources have not been affected as much as prehistoric resources, attributable in part to the location of historic-period resources away from present-day

development activities. Over the last 20 years, effects from development to historic resources have remained unchanged but could change in the future if development begins near historic areas and sites.

Vandalism of historic sites is a greater concern than development, and continues to be a problem. Vandalism has contributed to the deterioration of several sites, especially sites that are easy to access. Certain types of historic sites, such as abandoned towns, mines, and ranches have been damaged, as is the case for the Warm Springs Canyon Flume, Natural Bridge, and geyser, where the condition continues to deteriorate. Landslides and natural weathering continue to destroy and degrade the remaining intact portions of the flume. Unless stabilization and preservation measures are implemented, the entire flume might be lost.

Management Challenges for Regionally Significant Historic Trails and Early Highways (excluding National Historic Trails)

The regionally significant historic trails and early highways discussed in this section face management challenges similar to identified cultural resources, as described above. These trails are fragile and managing surface disturbance associated with motorized travel to limit degradation of the trails is a challenge.

Spiritual, Sacred, and Traditional Resources and Properties

This resource type is hard to quantify, because locations might not be well known or monitored by federal agencies. As development activities continue, impacts to spiritual and sacred sites and TCPs have increased. However, perhaps the best known resource in this category, Cedar Ridge, remains stable. The portion of Cedar Ridge in the planning area has not had much modern development and is being managed to protect its spiritual and sacred values.

General Issues and Management Challenges for Cultural Resources

Under current management, the BLM will continue to try to meet cultural resource management goals. Pressures on cultural resources will likely increase from continued oil and gas exploration and other development, and direct and cumulative effects will continue to degrade a portion of the cultural landscape. Case-by-case inventory in compliance with Section 106 of the NHPA will prevent harm to most individual sites, but the lack of comprehensive inventory coverage will continue to hamper broad-scale interpretation and assessment of cumulative effects. Inventories would probably continue at roughly 250 or more projects per year, with inventories covering approximately 7,500 acres per year.

Impacts to prehistoric resources that cannot be mitigated could be expected to occur once every 5 to 10 years; however, as oil and gas exploration and development increases, the potential for difficult cultural resource issues also increases. Impacts to trail resources that cannot be fully mitigated are expected to occur once each year, and the historic integrity of these resources is expected to continue to degrade as time goes on.

The demand for consumptive use of cultural resources through tourism and archeological research projects is low, but anticipated to increase over time. This reflects an increasing interest in history and the fragile nature of the resource. Historic trails, particularly those falling under the NHT system, could see increased visitation. Maintaining the historic setting is critical to providing a quality experience for visitors. The setting is an essential component in determining whether a trail segment contributes to the trail's overall significance.

The effects of natural weathering also will continue; these effects do not proceed in a linear fashion. As conditions deteriorate, there is a loss of plant cover and weather resistance, and the rate of deterioration increases. As physical degradation becomes more apparent and requires more effort (money) to restore, the necessary efforts to stabilize and restore these resources would continue to increase.

Collecting, looting, and vandalism of prehistoric and historic sites, which are difficult to quantify, is nevertheless forecast to continue to be a serious problem in the planning area. These activities contribute to the deterioration of sites. Certain types of sites, such as rock art sites, rock shelters, certain open sites, and historic structures would continue to suffer damage from these kinds of activities.

New types of motorized and nonmotorized vehicles have increased the access to remote parts of the planning area. This factor has accordingly increased the vulnerability of remote cultural resource sites through human-caused activities and degradation.

3.5.2. Paleontological Resources

Paleontological resources are defined as any fossilized remains, traces, or imprints of organisms, preserved in or on the Earth's crust, that are of paleontological interest and that provide information about the history of life on Earth. Paleontological resources (or fossils) can be the altered remnants of plants or animals (body fossils), or reflect their presence or actions (impressions and trace fossils). Fossils are typically preserved in sedimentary rocks, or in unique situations, igneous rocks. Paleontological resources can be microscopic (such as single-celled animals [bacteria] or pollen), or macroscopic (such as fossils of leaves, petrified wood, shells of invertebrate animals, bones, teeth, tracks, feeding traces, and burrows) and include fossils of animals including dinosaur bones or teeth and petrified wood.

Paleontological Resources Management

Management of paleontological resources is focused on protecting vertebrate and other scientifically significant fossils for the benefit of the public. Significant fossils include all vertebrate fossil remains, and plant and invertebrate fossils determined on a case-by-case basis to be scientifically unique. Abundance of these resources varies, with some geologic formations containing few or no significant fossils, and other formations known to commonly produce significant numbers of fossils throughout the formation.

Recently signed legislation supplements existing laws and guidance regarding paleontological resources on BLM-administered lands (e.g., FLPMA, BLM Manual 8270, and BLM Handbook H-8270-1). The Paleontological Resources Preservation Act became law on March 30, 2009, as part of the Omnibus Public Lands Management Act of 2009 (Public Law 111-011). The BLM has followed up with Instruction Memoranda that reinforce policies regarding confidentiality and paleontological collecting in light of the new law (IM dated June 11, 2012, "Collecting Paleontological Resources under the Paleontological Resources Preservation Act of 2009" and IM dated June 11, 2012, "Confidentiality of Paleontological Locality Information under the Omnibus Public Lands Act of 2009") (BLM 2012e, BLM 2012f).

Paleontological Collection Permits and Monitoring

Collecting fossils on BLM-administered lands is allowed with some restrictions, depending on the significance of the fossils. Hobby collecting of common invertebrate or plant fossils is

allowed in reasonable quantities, using only hand tools. Commercial collecting of fossils is not permitted. Collection of all vertebrate and any administratively designated plant or invertebrate fossils may be conducted only under permits issued to qualified researchers for reconnaissance work and collection of surface finds, with a 1 square meter surface disturbance limit. If the disturbance will exceed 1 square meter or require mechanized equipment, the researcher must apply for an excavation permit, which requires NEPA analysis. All paleontological resources collected under a paleontological resource use permit remain public property and must be curated in an approved repository.

The BLM Wyoming State Office issues permits and monitors these permits on an as-needed basis. Only a qualified paleontologist can be issued a paleontological resources use permit. At present, there are 31 active paleontological permits for various types of work in the planning area. Thirteen are for consultants working for land users; 17 are for research institutions performing surveys; and one is for a researcher performing excavation. The number of paleontological permits is expected to remain stable. Mitigation actions performed by qualified paleontological consultants would lead to an increase in known fossil localities and recovery of significant fossils that would otherwise have been undiscovered. This would result in an improvement of scientific knowledge and better management of the resource in the long term.

Potential Fossil Yield Classification

The BLM utilizes the Potential Fossil Yield Classification (PFYC) system to classify the potential to discover or effect significant paleontological resources. The PFYC is intended to assist in determining proper mitigation approaches for surface-disturbing activities, disposal or acquisition actions, recreation possibilities or limitations, and other BLM-authorized activities. The system also highlights areas likely to be a focus of paleontological research efforts or illegal collecting. There are five classes of potential fossil yield, ranging from Class 1 (“No Potential”) to Class 5 (“Very High Potential”), for vertebrate or scientifically important paleontological resources. The formations listed in Table 3.46, “Formations Containing “High” and “Very High” Potential Fossil Yield Classifications in the Planning Area” (p. 448) have been identified as having “high” or “very high” potential for containing fossil remains.

The formations that have high or very high potential for paleontological resources might be key features and could guide land use allocations or management decisions in the planning area (Map 70). Table 3.46, “Formations Containing “High” and “Very High” Potential Fossil Yield Classifications in the Planning Area” (p. 448) identifies these formations. Of known specific interest are the Wind River Formation (especially in the Lysite area), Mesozoic deposits in the Gas Hills and along Lander Slope, and Tertiary deposits near Bison Basin and Beaver Rim.

Table 3.46. Formations Containing “High” and “Very High” Potential Fossil Yield Classifications in the Planning Area

Formation	Age	Potential Fossil Yield Classification
White River Group	Oligocene and Eocene	5 – Very High
Wiggins Formation	Upper Eocene	5 – Very High
Washakie Formation	Upper Eocene	5 – Very High
Tepee Trail Formation	Upper Eocene	5 – Very High
Aycross Formation	Middle Eocene	5 – Very High
Wagon Bed Formation	Middle Eocene	5 – Very High
Bridger Formation	Middle Eocene	5 – Very High
Wind River Formation	Lower Eocene	5 – Very High

Formation	Age	Potential Fossil Yield Classification
Indian Meadows Formation	Lower Eocene	5 – Very High
Lance Formation	Upper Cretaceous	5 – Very High
Niobrara Formation	Upper Cretaceous	5 – Very High
Cloverly Formation	Lower Cretaceous	5 – Very High
Morrison Formation	Upper Jurassic	5 – Very High
Sundance Formation	Upper Jurassic	5 – Very High
Thermopolis Shale	Lower Cretaceous	4 – High
Wasatch Formation	Lower Eocene	5 – Very High
Source: BLM 2009a		

Formations of Class 3 potential are fossiliferous units where fossil content varies in significance and abundance. For Class 3 units the management concern is moderate or cannot be determined from existing data. Class 3 units include a broad range of paleontological potential. They include geologic units of unknown potential, as well as units of moderate or infrequent occurrence of significant fossils. Management considerations cover a broad range of options and could include predisturbance surveys, monitoring, or avoidance. Surface-disturbing activities will require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action, and whether that action could affect the paleontological resources. In addition, these units may contain areas that would be appropriate to designate as hobby collection areas due to the higher occurrence of common fossils and a lower concern about affecting significant paleontological resources.

As shown on Map 70, the majority of the planning area is classified as Class 3 and Class 5 geological formations.

Identified Paleontological Resources

Known fossil deposits represent a relatively young period of geologic history, starting with the Upper Jurassic Era, approximately 145 million years BP. During management analyses, these formations are being scrutinized more closely for their paleontological resources. Projects in areas with the above formations exposed at or near the surface might require further paleontological assessment before or during surface-disturbing activities.

Additional knowledge of paleontological resources in the planning area would be useful to managing and protecting these resources. Site-specific areas are undergoing intense investigation from academic institutions and consulting paleontologists. Areas of interest include Cenozoic formations exposed between Boysen Reservoir and Madden, between the Antelope Hills and Crooks Mountain, near Bison Basin, and Beaver Rim, and Mesozoic formations along the Lander Front and in the Gas Hills.

Indicators of location are based on the presence of the geologic formations. Indicators of condition measure the loss of characteristics that make the fossil locality or feature important for scientific use. Natural weathering, decay, erosion, improper collection, and vandalism can remove or damage characteristics that make the resource scientifically important.

The most prolific vertebrate-bearing formations are the Wind River, Wagon Bed, White River, and Morrison Formations. The Wind River Formation has produced early mammal fossils and is the focus of several national paleontological institutions. The Wagon Bed and White River Formations contain marine vertebrate fossils such as turtles. The Morrison Formation has been shown in this area to contain dinosaur remains.

Special Management for Paleontological Resources

Recently, paleontological resource management policies have been updated for the entire BLM. Additional information about formations known to contain significant fossil resources is being gathered and applied to better manage these resources. The BLM is now actively managing paleontological resources on public land, and land uses in high or very high potential fossil yield formations might be subject to survey, monitoring, avoidance, or recovery of significant fossil resources. There is active hobby collecting of invertebrate fossils in the planning area, although information documenting this type of use is limited.

Five specific areas have been identified as “High Potential Paleontological Areas,” as follows:

Bonneville to Lost Cabin

This large area contains extensive exposures of the Wind River Formation, a high-potential formation for fossil resources. In this area, the Wind River Formation contains significant fossils of early mammals and plants from the Eocene Epoch, which dates from about 55 to 34 million years BP. The development of early mammals after the demise of the dinosaurs is the main research focus of several institutions that work in this area.

Gas Hills

This area contains exposures of the Sundance Formation, a high-potential formation for fossil resources. In this area, the Redwater Shale of the Sundance Formation, which dates from about 155 to 160 million years BP, occasionally contains significant fossils of sea-going reptiles from the Upper Jurassic. The development of marine reptiles in North America is the main research focus of institutions that work in this area.

Lander Slope

This area contains exposures of the Morrison Formation, a high-potential formation for fossil resources from the Upper Jurassic Era. In this area, the Morrison Formation, which dates from about 156 to 147 million years BP, occasionally contains significant fossils of dinosaurs. The development of dinosaurs in North America is the main research focus of institutions that work in this area.

Beaver Rim Proposed National Natural Landmark

This proposed landmark covers an area of 1,120 acres and lies along the western end of the Beaver Divide in Fremont County. This area is considered significant for its well-defined stratigraphic sequence of Tertiary deposits, which are exposed along the slopes of the rim. The proposed National Natural Landmark (NNL) includes representative exposures of virtually complete Early Eocene Epoch through Miocene Epoch stratigraphic sequences. This nearly complete sequence is very rarely exposed and is important to the understanding of Wyoming Tertiary geology. The area also is highly representative of the geological difference between the degrading Wind River Basin to the north and west and the more stable upland Sweetwater Plateau. The possibilities of exposed fossil materials and the stark scenic beauty of the area also add to the significance of this area. The proposed NNL is composed entirely of BLM-administered public lands and the agency manages this area for protection of its natural values.

Bison Basin Proposed National Natural Landmark

This locality covers 1,280 acres and lies on the south flanks of the Sweetwater Arch in southern Fremont County, just north of the Great Divide Basin. The proposed NNL is considered significant because of its mammalian fossil remains. These remains are from late Paleocene Epoch sediments, and have been studied by several geological surveys and institutions. The fossil types have been found to be highly significant for scientific research and have been found in unusual quantities. Future use of the area for paleontological research could significantly add to the base of scientific knowledge about Paleocene mammalian typology. The proposed NNL is composed entirely of BLM-administered public lands.

Management Challenges for Paleontological Resources

Management challenges for paleontological resources focus on preservation of the resources. Increased levels of identification, avoidance, and recovery of significant fossils through increasing application of mitigation measures help to protect paleontological resources and add to the base of scientific knowledge. Although energy-related development over the next 5 to 10 years would result in increased adverse effects to paleontological resources, additional mitigation efforts would offset many of the adverse effects caused by this development and are addressed at project-level NEPA analysis. Some significant fossils will be destroyed during surface-disturbing activities, but predisturbance surveys and onsite monitoring efforts would also protect many that would have been lost without these efforts.

Natural weathering and erosion will continue to destroy fossils and management or mitigation cannot alter this deterioration, although actions that would deter accelerated erosion would also serve to indirectly protect paleontological resources from some natural or human-caused erosion. Collecting and looting of paleontological resources, which are difficult to quantify, continue to be a problem in the planning area. These activities contribute to the deterioration of paleontological localities due to the loss of scientific information and due to the loss of locality integrity and context. Providing adequate law enforcement to deter this type of activity also remains a challenge.

3.5.3. Visual Resources

The BLM has a stewardship responsibility to identify and protect visual resources on BLM-administered lands. This section describes the BLM Visual Resource Inventory (VRI) and VRM systems and summarizes important visual resources in the planning area.

Visual Resource Inventory Classes

The BLM uses a VRI and VRM system, respectively, to classify the aesthetic value of its lands and set management objectives during the planning process. The system involves assessing visual values and assigning them to one of four VRI Classes (Classes I to IV) based on three factors: scenic quality, visual sensitivity, and distance from travel or observation points. VRI Classes are a general measure of the visual value of a landscape. Scenic quality is a measure of the visual appeal of a tract of land, while visual sensitivity is a measure of public concern for scenic quality in a given area. Distance is assessed by breaking the landscape into three zones (foreground and middleground, background, and seldom seen areas) based on relative visibility from travel routes or other observation points.

The BLM completed a VRI of the planning area in 2009 that represents the current conditions (baseline) for this document. The new VRI will provide the basis of VRM Classes and new management decisions in this RMP.

Visual Resource Inventory Classes in the Planning Area

Table 3.47, “Visual Resource Inventory Classes” (p. 452) lists acreage by VRI Classes for all lands in the planning area from the new VRI. Map 74 shows the new VRI Classes, and Maps 71 through 73 show the three inventory considerations (distance zone, visual sensitivity, and scenic quality) used to develop the new inventory classes. For reference, Map 75 shows the VRM Classes established in the existing 1987 RMP. Under the new VRI, the majority of the planning area is within VRI Classes III and IV.

Table 3.47. Visual Resource Inventory Classes

Visual Resource Inventory Class	BLM-administered surface (acres)
I	54,682
II	570,502
III	849,370
IV	917,485
Source: BLM 2012a	

VRI Class III and IV areas are generally on or near linear infrastructure routes, in areas undergoing oil and gas exploration or other development, and in areas with less visual variety. VRI Class I and II areas possess outstanding scenic quality and high visual sensitivity. Such areas in the planning area include Sweetwater Rocks, Beaver Rim, Sweetwater Canyon, Red Canyon, South Pass Historic Landscape, Green Mountain, the Lander Slope, and Dubois Badlands. VRI Class I and II areas associated with travel corridors include:

- Sweetwater Basin to Beaver Rim (from Highway 220 south to State Highway 287 from Muddy Gap northwest to Beaver Creek);
- Highway 28 starting at or near Commissary Hill through the South Pass historic landscape to the planning area boundary;
- State Highway 287 from the WRIR boundary north to the planning area boundary, including small portions of the Wyoming Centennial Scenic Byway;
- Highway 20/789 from Shoshoni to the WRIR line, recently designated as the Wind River Canyon Scenic Byway; and
- The NHTs and CDNST Corridors.

Visual Resource Management Classes

VRM Classes are different than VRI Classes and are established during the RMP planning process and approved in the ROD. The management classes establish a measurable standard for the amount of change allowed to a specific area's visual resource.

The following are the objectives or standards for each VRM Class:

- Class I: The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited

management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

- Class II: The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- Class III: The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
- Class IV: The objective of this class is to provide for management activities that require major modifications to the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Visual Resource Management in the Planning Area

Visual resources are currently managed according to VRM Classes established in the 1987 RMP (Map 75). The inventory that was utilized in the 1987 RMP was neither complete nor conducted under current guidance. VRM Classes were discussed in the EIS prepared for the RMP but did not update earlier management actions and VRM Classes were not transferred to the ROD.

Modern management techniques for visual resources incorporate mitigation methods and BMPs for minimizing the impact of BLM-authorized activities on visual resources. BMPs are utilized to limit impacts from development on visual resources. The recent trend in VRM and mitigation of impacts to visual resources has been upward, reflecting a change in earlier management that allowed developments such as citing towers on mountaintops or fencing and water development projects near the NHTs.

Currently, site-specific mitigation of impacts to visual resources is being implemented through project level analysis, with reference to the 1987 RMP and EIS. The VRI that produced these VRM Classes did not map distance zones and visual sensitivity levels. This factor contributes to an overall challenge of managing neighboring visual planning units with contrasting objectives (such as actions in a Class IV area viewed from a Class II). The route for the CDNST was delineated after the VRM Classes were established resulting in visual impacts to the trail's viewshed resulting in adverse impacts to the recreational experiences and benefits of the user.

Visual Resource Conditions

The planning area contains a moderate number of areas that possess a high degree of scenic quality and visual sensitivity. In general, high scenic quality is a product of the area's topography, geology, and cultural history. Scenically diverse vistas and canyon riverways, unusual geologic formations, colorful and highly contrasting sandstones, and numerous historic remnants contribute to the area's high scenic quality. Areas with high visual sensitivity (e.g., Split Rock, Red Canyon,

Dubois Badlands, and NHTs) are the result of visitor interest in and public concern for a particular area's visual resources, an area's high degree of public visibility, the level of use by the public, or the type of visitor use an area receives.

Important Visual Resources

The planning area encompasses two major physiographic provinces, the middle Rocky Mountains and the Wyoming Basin, which form the base of the visual resources key features. Table 3.48, "Unique Scenic Features in the Planning Area, Current Management, and New Inventory Classes" (p. 454) lists unique scenic features by physiographic province, the VRM Classes for the area under current management, the new VRI Classes, and a short discussion of the visual characteristics in the area (factors influencing visual resource class designation and management).

Table 3.48. Unique Scenic Features in the Planning Area, Current Management, and New Inventory Classes

Unique Scenic Features	Current Visual Resource Management Class ¹	New Visual Resource Inventory Class	Factors Influencing Class Designation or Management
Wyoming Basin Physiographic Province			
Beaver Rim	II, III	II, III	The area is a large landscape feature with a lot of contrast. The area creates a strong lateral horizon line across U.S. Highway 287 and State Highway 135 corridors. The top of the rim provides views of adjacent mountain ranges and the Wind River Basin.
Burnt Ranch	II	II	The area consists of mixed private and public lands that, coupled with the historic landscape, create a viewshed with high visual sensitivity.
Castle Gardens Petroglyph Site	II, III	IV	The site is an important cultural resource area with high recreational use. Visual sensitivity in this area is high.
Cedar Ridge	III	II	The area is a high-use recreation area, with color contrast and large sandstone abutments.
Continental Divide National Scenic Trail Corridor	II, III, IV, V	II, III	The trail corridor through the planning area is an important recreation setting. Visual sensitivity along the route is high; in addition, this is part of a small section of the entire trail that displays the physiographic province.

Unique Scenic Features	Current Visual Resource Management Class ¹	New Visual Resource Inventory Class	Factors Influencing Class Designation or Management
Green Mountain	II, III, V	II, III	The area is a mountainous landscape unique to the Wyoming Basin and is popular for recreational use. The landscape contains high amounts of contrast and scenic overlooks spanning the Sweetwater Valley and Continental Divide Basin.
National Historic Trail Corridor	I, II	I, II	High visitation and public interest coupled with a historic landscape create high visual sensitivity. Adjacent views of Sweetwater Rocks and Wind River Mountains are of historical significance.
Rattlesnake Hills	II, III, IV	IV	The area contains high-contrast mountainous terrain with mixed conifer and aspen pockets unique to the physiographic province.
Red Butte	II, III	II	This is a highly visible feature from Lander and surrounding areas.
Red Canyon	I	II	The area is a designated National Natural Landmark with high visual sensitivity. The canyon is considered an identifying landscape for the Lander area.
South Pass Historic Landscape	I, II, III, IV	II, III	This landscape contains historic and prehistoric resources, developed recreation sites, and a moderate scenic quality.
Copper Mountains Lysite Mountain	II, III, IV	I, II, III	The area is mountainous and includes rugged cliffs and slopes. Views of Boysen Reservoir and Wind River Canyon complement this viewshed. The WSA in this area contributes to the area's visual sensitivity level.
Sweetwater Canyon	II	I	This canyon runs through a prairie canyon ecosystem and includes diverse topography with high-contrast riparian-wetland vegetation types such as aspen and cottonwood. The WSA in this area contributes to the area's visual sensitivity.

Unique Scenic Features	Current Visual Resource Management Class ¹	New Visual Resource Inventory Class	Factors Influencing Class Designation or Management
Sweetwater Rocks/Granite Mountains/Sentinel Rocks	II, III	I, II	There is a high degree of contrast between the high granite mountains and the adjacent plains. The area provides the backdrop for the historical trail, and the Sweetwater River is visible from many areas within the rocks. Four WSAs in this viewshed contribute to the area's visual sensitivity.
Table Mountain-Lander	II, III	II	This highly visible feature is in view from the city of Lander and surrounding areas.
Twin Creek	II, III, IV	II, III	The chugwater formations in the area create high color and landform contrast. Adjacent scenery and features add to the visual setting.
Mixed Middle Rocky Mountains and Wyoming Basin Physiographic Province			
Dubois Area	II, III, IV, V	I, II, III	This high-contrast viewshed spans floodplains, badlands, mountainous terrain, and peaks. The area serves as an identity landscape for the town of Dubois and supports a number of recreational uses. The two WSAs in this area contribute to the area's visual sensitivity.
Eastern Aspect of the Wind River Range	I, II, III	II, III	This area is within view from most residential areas near Riverton, Lander, and Hudson and produces a high degree of visual sensitivity. Numerous canyon riverways and rugged terrain support a number of recreational uses. The area contributes to several adjacent viewsheds within the planning area.
Sources: BLM 1987a; BLM 2012a			
¹ The existing plan utilized an outdated classification system; management under this system included a VRM Class V. VRM Class V was established to manage areas primarily for rehabilitation or enhancement of landscape character. U.S. United States VRM Visual Resource Management WSA Wilderness Study Area			

Management Challenges for Visual Resources

The nature of development in the planning area and the slow rehabilitation of lands following disturbance have resulted in cumulative adverse impacts to scenic quality. The current management of visual resources to control the contrast, location, finishing, and staging of developments on BLM-administered lands allows the BLM to control for the impacts of such projects, and has helped to minimize adverse effects on visual resources in the planning area. However, impacts from the increases in recreation and tourism, travel, ROW development (especially development of large wind turbines), mineral development, activities in support of livestock grazing, and other land use disturbances still occur despite management.

Historic land uses also continue to affect viewsheds because these activities were permitted before the current system of visual contrast rating and implementation of visual mitigation were instituted. VRM objectives are being met in most places, but the challenge of meeting these objectives in the future is expected to increase. Of particular concern are areas managed to maintain the existing visual environment (e.g., VRM Class I and II areas) that are within view of areas managed to allow more intensive development (e.g., VRM Class III and IV areas).

There have been conflicts between visual resources and these other uses in the Beaver Rim, South Pass, Oregon Trail (and other NHTs), and CDNST landscapes. Conflicts associated with visual resources typically are a product of maintaining VRM objectives and the increased importance of the visual environment to the public (due to increased use, better public access and changes in land use patterns such as the designation of the CDNST).

The visual environment may experience moderate to major modification pending the approval of large, utility-scale renewable energy development, such as wind energy, and electrical transmission lines to transport energy generated from these potential facilities. These high profile intrusions do not lend themselves to the typical sighting and design methods used to mitigate the impact to visual resources. Wind potential is higher in locations of high visual prominence at elevated locations and on ridges and rims such as Cyclone Rim or Beaver Rim. Recreational opportunities, experiences, and benefits often depend on the scenic quality of landscapes, and these developments have the potential to affect recreational use, including along the CDNST and NHTs.

3.6. Land Resources

Land resources include lands and realty, renewable energy, ROWs and corridors, comprehensive trails and travel management, livestock grazing, and recreation. Each resource section describes the resource, its existing condition, and management challenges related to the resource.

3.6.1. Lands and Realty

The lands and realty program manages BLM-administered land that supports all resource and management programs in the planning area. Management decisions for lands and realty are limited to BLM-administered public lands, although lands and realty actions during the life of the plan could involve other surface managers (through easements and land tenure adjustments). The primary activities of the lands and realty program include (1) land use authorizations such as Recreation and Public Purposes (R&PP) leases, FLPMA leases and permits, (2) land tenure adjustments, including sales and other types of disposal actions, exchanges, donations, land acquisitions and interests in lands (access easements), and (3) withdrawals, classifications, and segregations. As part of the processing of lands and realty actions, the BLM works cooperatively

with other federal agencies, the State of Wyoming, cities, counties, and public and private landholders.

3.6.1.1. Land Status

The planning area is composed of mixed surface ownership totaling 6,487,464 acres (Map 1). The BLM manages the largest amount of land in the planning area, administering a total of 2,394,210 acres (Table 3.49, “Surface Ownership in the Planning Area” (p. 458)).

Table 3.49. Surface Ownership in the Planning Area

Surface Manager	Acres Managed	Percent of Planning Area
Bureau of Land Management	2,394,210	37
U.S. Forest Service	875,605	13
Bureau of Reclamation	125,706	2
Bureau of Indian Affairs (Wind River Indian Reservation)	1,546,505	24
U.S. Fish and Wildlife Service	112	<1
Department of Defense	1,340	<1
State of Wyoming	278,131	4
Private	1,223,421	19
Water	42,434	<1
Total	6,487,464	100%
Source: BLM 2012a		
< less than		

There are many isolated parcels of state land and private land dispersed throughout the planning area interspersed with public land. Map 1 shows the existing surface management pattern; Table 3.50, “BLM-Administered Surface by County in the Planning Area” (p. 458) lists the acreage of BLM-administered surface by county.

Table 3.50. BLM-Administered Surface by County in the Planning Area

County	BLM-administered surface (acres)
Carbon	38,406
Fremont	1,933,364
Hot Springs	1,779
Natrona	297,991
Sweetwater	122,670
Total	2,394,210
Source: BLM 2012a	
BLM Bureau of Land Management	

3.6.1.2. Land Use Authorizations

Land use authorizations include various authorizations to use public surface for leases, including permits and easements under Section 302(b) of FLPMA; R&PP leases under the R&PP Act of 1926 (43 U.S.C. 869 et seq.); and airport leases under the Federal Public Airport Act of 1928, as amended (49 U.S.C. Appendix, Sections 211-213). This section briefly describes land use authorizations and the authorizing regulations for these lands and realty actions.

Leases, Permits, and Easements

Section 302(b) of FLPMA authorizes the BLM to issue leases, permits, and easements for the use, occupancy, and development of public lands. Since the 1987 RMP, the most common type of this land use authorization has been minimum impact land use permits for commercial filming on public lands. Additionally, the BLM issued permits for water well testing and monitoring and short-term equipment storage. At present, the Lander Field Office administers three land use leases: one for the Martin's Cove Site consisting of 927 acres, an agricultural lease consisting of 11 acres (authorized as resolution of unauthorized use), and a corral and barn consisting of less than 1 acre (authorized as resolution of unauthorized use). The Lander Field Office authorizes numerous easements across BLM-administered land for access to private land.

Recreation and Public Purposes Act Leases and Conveyances

The R&PP Act authorizes the BLM to lease or convey public surface to state and local governments and qualified nonprofit organizations for recreation and/or public purpose uses. Typical uses under the R&PP Act include historic monument sites, campgrounds, schools, parks, public works facilities, and hospitals. Lands are typically leased first until development of the site is completed and then, if appropriate, the BLM may convey title. Lands proposed to be leased or conveyed under the R&PP Act must first be classified as suitable for such use. R&PP classifications segregate the land from operation of the public land laws except for the R&PP Act, which precludes disposal by sale, exchange, or other means, but specifically allows for R&PP lease or conveyance. R&PP classifications also segregate the lands from operation of the mining laws, closing the area to mining of locatable minerals. R&PP classifications do not segregate lands from mineral leasing.

In 1966, the BLM granted a patent to the Natrona County School District under the R&PP Act for 1.25 acres in the eastern part of the planning area in Township 32 North, Range 85 West for use as a public school. This patent (Number 49-66-0085) contains a provision that if the parcel was not used for school purposes, it would revert to the United States. Natrona County has stopped using the parcel for school purposes and its reversion to the United States is being prepared.

Since the 1987 RMP, the Lander Field Office has issued two R&PP leases for a total of 35 acres, and seven patents under the R&PP Act authority.

3.6.1.3. Unauthorized Use/Trespass

Unauthorized use/trespass is the use, occupancy, or development of public land or its resources without a required authorization, or in a way that is beyond the scope and terms and conditions of an authorization; this definition excludes uses defined as casual use in the regulations (43 CFR 2920.1-2[a]).

Existing management guides the resolution of unauthorized land uses through cessation of use, authorization by ROW, lease or permit, or disposal (though direct sale under FLPMA Section 203). The existing plan identified specific criteria for considering decisions about unauthorized use and directed that new cases of unauthorized use would generally be immediately terminated (see management challenges at the end of this section for a discussion of challenges associated with unauthorized use) (BLM 1987b). Under existing management, the BLM might issue temporary permits to provide short-term authorization, unless the situation warrants immediate cessation of the use and restoration of the land. The BLM gives highest priority to the following unauthorized uses: new authorized activities or uses where prompt action could minimize

damage to public resources; cases in which delay might be detrimental to authorized users; cases involving special areas, sensitive ecosystems, and resources of national significance; and cases involving malicious or criminal activities. The most common occurrences of unauthorized use/trespass in the planning area are illegal dumping, roadways, home sites, irrigation and agricultural development, pipelines, and powerlines.

Trespass is an ongoing problem in the planning area. Limited staff and funding is a contributing factor, allowing trespass to continue unabated. When trespass actions go undetected or unresolved, there is no incentive or deterrent for offenders to cease further trespass action. At present there are 30 unresolved potential unauthorized use/trespass cases pending in the planning area. On average, the Lander Field Office resolves one unauthorized use/trespass case per year. Resolution of trespass in the planning area includes payment of administrative costs, rental value for period of use, penalties (assessed based on the non-willful, willful, or repeated willful nature of the use), and can include removal, rehabilitation, and restoration of affected lands or authorization of the use. Authorization of an unauthorized use/trespass in the planning area, when appropriate, has been accomplished through issuance of a land use permit, land use lease, or a ROW, whichever authorization is most appropriate based on the use.

3.6.1.4. Land Tenure Adjustments

Adjustments to land ownership (land tenure) are an important component of the BLM land management strategy. The Lander Field Office completes land tenure adjustments when such transactions are in the public interest and consistent with local land use plans. Land tenure adjustment refers to lands and realty actions that result in the BLM disposing of public land or acquiring non-federal lands or interests in lands. FLPMA requires that public land be retained in public ownership unless, as a result of land use planning, disposal of certain parcels is justified. Parcels designated as potentially available for disposal are more likely to be conveyed out of federal ownership through an exchange rather than a sale. Acquisition of land and interests in lands are important components of the BLM land tenure adjustment strategy. Acquisition of and interests in land can be accomplished through several methods, including exchange, purchase, donation, and condemnation (there have not been nor are there likely to be donation or condemnations in the planning area). The BLM often acquires lands and interests in lands for the following actions:

- Improve management of public land resources through consolidation of federal, state, and private lands.
- Secure key property necessary to protect endangered species, promote biological diversity, increase recreational opportunities, and preserve archeological and historical resources.
- Implement specific acquisitions authorized or directed by acts of Congress.
- Improve access to BLM-administered lands across private lands.

The land ownership pattern in the planning area mainly consists of large blocks of public land surrounding scattered parcels of private and state lands (Map 1). The percentage of ownership in the planning area is identified in Table 3.49, “Surface Ownership in the Planning Area” (p. 458). In addition to these large blocks, there are areas of scattered public lands within parcels of state and private lands. These scattered parcels can be difficult to manage as part of the public land system. In many cases the small size of the scattered parcels, their isolation from other parcels of public land, and lack of legal access can make their retention in public ownership of marginal

utility. Occasionally, these isolated parcels can serve other resource purposes, such as providing wildlife habitat in an area that has been fragmented by suburban development.

Appendix R (p. 1623) identifies lands that the public proposed for land tenure adjustment. The public proposed these lands for a variety of reasons such as for protecting wildlife habitat and open space and preserving cultural, historic, and recreational values, or for personal reasons having to do with other property.

Purchases

Under Section 205 of FLPMA, the BLM has the authority to purchase lands or interests in lands. Similar to other acquisitions, purchase is used to acquire key natural resources or to acquire legal ownership of lands that enhance the management of existing public lands and resources. Acquisition of land through purchase helps consolidate management areas to strengthen resource protection. Acquisition of land by purchase is used sparingly given the limited funds available through appropriations.

The primary purpose of purchase within the planning area has been to provide easements or access to BLM-administered lands or for the benefit of other resources such as wildlife management areas. The federal Land and Water Conservation Fund provides money to federal agencies, as well as state and local governments, to acquire land that would benefit the public such as for improved recreational access and the protection of historical sites. Acquiring access easements across non-federal lands for roads and trails provides for legal public access to “landlocked” public lands and for the connectivity of trails. Easement acquisition has been a long-term goal in the planning area, primarily because of the scattered land pattern. Since the 1987 RMP, the Lander Field Office has obtained 12 easements for access. A typical example of an easement in the planning area is the Shoshone Lake Road easement, which provides public access to BLM-administered lands.

Public scoping has identified areas in which improved access to BLM-administered lands would improve public access. Improved public access would likely be accomplished through the acquisition of easements (through purchase or donation) or acquiring lands or interests in lands for access through exchange or donation. The Sweetwater Rocks has been identified as a particular area in which improved access would benefit public use of BLM-administered land.

Land Disposal (Land Sales)

Public lands have the potential for disposal when they are isolated and/or difficult to manage. Disposal actions are often in response to a public request, such as community expansion. Disposals result in a title transfer, wherein the lands leave the public domain. The BLM coordinates all disposal actions with adjoining landowners, local governments, and existing land users.

The BLM manages public sales under the disposal criteria set forth in Section 203 of FLPMA. Public lands determined suitable for sale are offered on the initiative of the BLM or through a public nomination/request for sale. The BLM does not sell lands for less than fair market value. The RMP must identify lands suitable for sale. Any lands to be disposed of by sale that are not identified in the current RMP require a plan amendment. Lands identified for disposal under current management are identified in Appendix S (p. 1629).

At present, there are two categories for lands identified for disposal in the planning area. Lands identified for disposal with restrictions must meet specific restrictions before they can be disposed. These restrictions include limitations to whom the lands can be disposed to (such as

lands that can only be disposed of to the WGFD) or the purposes for which the lands may be used, and the resource values that must be acquired if a parcel of land is disposed through exchange (lands must be acquired with similar or higher resource values than the lands that are disposed of). Some of these concerns can be addressed through easements or restrictions on use. The remaining lands identified for disposal are general lands identified for disposal with no specific restrictions. A total of 1,475 acres of BLM-administered surface lands are identified for disposal with restrictions in the planning area, and 8,573 acres of BLM-administered surface lands are identified for disposal without restrictions (Map 94).

Since approval of the existing plan, some parcels, totaling 1,468 acres of BLM-administered surface, have been disposed of under the authority of Section 203, including the Riverton Landfill and Railroad Grade to South Pass City.

The table in Appendix S (p. 1629) has a column titled “Parcel No.” The number was originally assigned to the parcels in the 1987 RMP and used to simplify identification of parcels on planning area maps. The 1987 RMP identified parcels for disposal; these parcels, save the parcels already sold or exchanged, are carried forward in Alternative A. Consequently, there are gaps in the parcel numbers; for example, there are no parcel numbers 3 and 4, as these parcels are no longer in ownership of the United States. Similarly, there is no parcel number 2; the 1987 range of alternatives considered this parcel for disposal but it was not part of the Preferred Alternative and not identified in the 1987 RMP for disposal. Three new parcels have been identified in Alternative D for disposal. These are two parcels identified for disposal to the DOE because they contain uranium mill tailings and a third parcel that is discussed above under the R&PP Act as being in the process of reverting to the United States because it is no longer being used by the Natrona County School District for school purposes. During the 1987 RMP analysis, these parcels were not considered because they were in current use and disposal was not relevant.

Exchanges

Exchange is the process of trading lands or interests in lands between the BLM and a second landowner. Conducted under the authority of Section 206 of the FLPMA, exchange is a tool that enables the BLM and other landowners to improve land management, consolidate ownership, and protect environmentally sensitive areas. By exchanging public land that is isolated and difficult to manage, the BLM is able to acquire other lands with importance for recreation, wildlife, fisheries, wetlands, habitat for threatened and endangered species, wilderness, open space, scenic, cultural and other resource conservation purposes. Land exchanges allow the BLM to reposition lands into more manageable units and to meet community expansion needs.

Exchange is the preferable means by which land is disposed of and primarily the means by which land is acquired. Except for exchanges that are congressionally mandated or judicially required, exchanges are voluntary and discretionary transactions with willing landowners. Lands to be exchanged must be of approximately equal monetary value and in the same state. Exchanges must also be in the public interest and conform to applicable BLM land use plans and other relevant guidance.

Since approval of the 1987 RMP, three exchanges have been completed that affected lands in the planning area. The Steers exchange (80 acres) allowed the Lander Field Office to acquire lands for wildlife and recreation. The Red Creek (2,862 acres acquired) and Eastman (1,030 acres acquired) exchanges facilitated the acquisition of lands in the Whiskey Mountain area for the protection of bighorn sheep range and sensitive cultural areas. In recent years, there has been only modest exchange activity in the planning area, although interest in exchanges is increasing.

Lands Identified for Retention

The FLPMA enunciates a federal policy of retention of BLM-administered lands for multiple use management, unless the lands are specifically identified for disposal (through the land use planning process) and would serve the public interest (such as classification and ultimate disposal under the R&PP Act). Pre-FLPMA classifications also identified lands that were classified for retention.

Lands identified for retention in the planning area are BLM-administered surface lands not identified for disposal. The BLM is to retain the parcels identified for retention for multiple use management, but the agency may consider the parcels for disposal on a case-by-case basis. At present, there are 2,385,637 acres of BLM-administered surface identified for retention in the planning area (Map 94).

3.6.1.5. Withdrawals and Classifications

Lands are withdrawn under the authority of Section 204 of the FLPMA or by Congressional Act. A withdrawal is a formal action that withholds an area of public land from specific actions, such as settlement, sale, location, and entry under the mining laws (locatable mineral development). Withdrawals are made with the purpose of limiting activities under those laws in order to maintain other public and resource values in the area, to reserve the area for a particular public purpose or program, or to transfer jurisdiction over an area of federal land from one department, bureau, or agency to another. Withdrawals are established for a wide range of public purposes, including military reservations, reclamation projects, and power site reserves.

The BLM has established withdrawals in the planning area to close specific sites and protect existing resource values (such as wildlife, sensitive species habitat, and historic and cultural sites) as part of the classification process (in preparation for lease or conveyance of land) and to transfer public land to other federal agencies to accomplish their mission goals. Existing withdrawals, classifications, and other segregations in the planning area are identified in Table 3.51, “Existing Withdrawals, Classifications, and Other Segregations in the Planning Area” (p. 463) and withdrawals are displayed on Map 21. At present, approximately 31,767 acres in the planning area are withdrawn from location and entry under the Mining Laws including 8,634 acres of pre-FLPMA segregations (as discussed below).

Table 3.51. Existing Withdrawals, Classifications, and Other Segregations in the Planning Area

Name	Acres	Segregates/Withdraws from	
		Disposal	Locatable Minerals
Resource Protection			
Elk Range	11,085	X	X
Elk Pasture	3,229	X	X
Whiskey Mountain Big Horn Sheep Winter Range	11,019	X	X
Warm Springs Canyon	188		
Oregon Trail (Sites along the Oregon Trail that are withdrawn are identified below)	315	X	X
Split Rock (NRHP and Interpretive Site)	887	X	X

Name	Acres	Segregates/Withdraws from	
		Disposal	Locatable Minerals
Devil's Gate (Including Interpretive Site)	508	X	X
Rocky Ridge Site	555	X	X
Aspen Grove Site	889	X	X
Castle Gardens	78	X	X
Martins Cove	927	X	X
Green Mountain (Campground and Picnic Sites)	100	X	X
Wildhorse Point	20	X	X
South Pass Area	751	X	X
Miners Delight NRHP Site	173	X	X
South Pass City NRHP Site	698	X	X
Yermo xanthocephalus (Desert Yellowhead) plant habitat	360	X	X
Classifications			
R&PP Classifications	247	X	X
Land Patents (Under Section 203 & 206 of FLPMA or R&PP Act Conveyances)	1,899	X	X
Proposed Land Exchange	122	X	X
Classification and Multiple Use	1,623	X	X
Source: BLM 2012a			
FLPMA Federal Land Policy and Management Act			
NRHP National Register of Historic Places			
R&PP Recreation and Public Purposes			

Pre-FLPMA classifications also identified lands for segregation from application of the mining laws. These segregations (8,364 acres), adopted through Act of Congress, are not subject to the time limits of segregations and withdrawals under current mineral laws. Lands proposed to be leased or conveyed under the R&PP Act must first be classified as suitable for such use. R&PP classifications segregate the land from operation of the public land laws except for the R&PP Act, which precludes disposal by sale, exchange, or other means, but specifically allows for R&PP lease or conveyance. R&PP classifications also segregate lands from operation of the mining laws, closing the area to mining of locatable minerals. R&PP classifications do not segregate lands from mineral leasing (oil and gas development). R&PP leases and conveyances reserve all minerals in the land to the United States. At present, there are no pending R&PP classifications in the planning area associated with an application through the R&PP Act, although two potential R&PP leases for recreational use have been identified as possible actions to be considered to meet identified public demand. A small number of R&PP applications are expected over the next two decades in the planning area. Public land could be needed for expansion of existing facilities and for new facilities to support growing local communities. The growth of Lander, Riverton, and Dubois has been slow but steady for the last decade. However, the small amount of BLM-administered land near the growth areas is also important to wildlife and recreational uses, and might not meet the BLM's criteria for disposal.

Some lands in the planning area that were previously used for uranium mill sites, processing, and storage of processing waste (tailings) should be managed by the DOE for long-term monitoring and oversight due to radioactivity levels in the tailings. There are several former mill sites for

which this process is underway in the planning area. Lands transferred to the DOE are withdrawn from operation of public land laws, mining laws, and all other public activities. The area currently identified is approximately 2,100 acres, but it is likely that additional areas will be identified in the future. Refer to the *Locatable Minerals* section of this chapter for more information.

Management Challenges for Lands and Realty

A variety of management challenges exist for the lands and realty program based on historic activities and trends as well as current and future needs of public resources by both internal and external customers. Most management challenges for the lands and realty program are associated with balancing land tenure adjustments and land use authorizations with the maintenance of BLM resource objectives and the needs and desires of the public and other federal agencies.

Managing isolated tracts of BLM-administered lands surrounded by private land poses considerable challenges by limiting administrative access to carry out management and fulfill management objectives. In some cases, new owners of recently transferred private land in the planning area no longer allow the BLM to cross their private land to access BLM-administered land. Facilitating access to these parcels through acquiring easements or considering land tenure adjustments to resolve access issues is a management challenge for the lands and realty program. Subdivision of private land in the planning area also creates challenges related to the access of BLM-administered lands by both private users and for administrative access by the BLM. Subdivision of private land also creates fragmentation and isolates BLM-administered lands. Additional management challenges associated with access result from limited or unavailable access to BLM-administered lands by recreational users, resulting in unauthorized access across private land. Challenges associated with recreation access are an issue in the Sweetwater Rocks area.

Unauthorized use and illegal dumping are additional management challenges for the lands and realty program. Trespass actions such as illegal dumping can cause unmitigated damage to public lands and natural resources. If the BLM is unable to identify a responsible party, the cost to resolve trespass and to clean up and reclaim the affected public land is often passed on to the public. These costs direct appropriated funds away from planned work and affect the BLM's ability to complete its mission. In addition, the public does not realize the fair market value for unauthorized use of the public lands. Unauthorized use has increased in the planning area due to increased motorized vehicle use, which allows access to previously inaccessible areas.

The BLM faces a staffing and resources challenge related to resolving unauthorized use issues and fulfilling other lands and realty actions (such as reviewing leases and permits, performing cultural and biological surveys before a land tenure adjustment, monitoring land conditions, and ensuring ROW compliance). The increasing number of applications for ROWs for wind-energy development and other land use authorizations requires considerable time and effort for lands and realty personnel to process. This constrains the time and availability of lands and realty personnel to fulfill other related actions.

3.6.2. Renewable Energy

Solar, wind, biomass, and geothermal resources are considered renewable energy resources. Wind energy produces electrical energy through the use of large wind turbines. Solar power refers to energy from the sun that is converted into thermal or electrical energy. Geothermal energy is derived from the heat stored in the interior of the Earth. Biomass energy is the burning or use

of organic materials as a source of energy. Wind, solar and biomass facilities are processed through the lands and realty program and authorized under Title V of the FLPMA as ROW actions. Geothermal resources are considered a fluid leasable mineral, and the BLM processes geothermal actions according to the provisions of the Mineral Leasing Act, see the *Leasable Minerals – Geothermal* section.

The BLM policy is to encourage the development of renewable energy in acceptable areas. Additionally, Executive Order 13212, Actions to Expedite Energy-Related Projects (May 18, 2001), instructs the BLM “to expedite projects that will increase the production, transmission, or conservation of energy.” As demand has increased for clean and viable energy to power the nation, consideration of renewable energy sources on BLM-administered land has become a necessary component of land management planning.

In March 2009, the Secretary of the Interior issued a secretarial order making the production, development, and delivery of renewable energy on public land a top priority for the DOI. In addition to making renewable energy production a top priority for the department, the secretarial order established an energy and climate change task force to spur the renewable energy agenda and identify specific zones on U.S. public lands where the DOI can facilitate a rapid and responsible move to large-scale production of solar, wind, biomass, and geothermal energy.

In cooperation with the DOE National Renewable Energy Laboratory (NREL), the BLM assessed renewable energy resources on BLM-administered land in the western United States, including Wyoming (BLM and DOE 2003). The BLM reviewed the potential for solar power, wind, biomass, and geothermal energy on DOI, Bureau of Indian Affairs, and USFS lands in the western United States. Additional programmatic level documents for wind, geothermal, and solar (a Draft Solar PEIS is under development) describe development potential and policies and BMPs for renewable energy resources on public lands. Development of renewable energy resources on public lands follows policy and BMPs identified in these PEISs and other resource specific guidance.

Based on current policy direction and advances in technology, there is potential for renewable energy development in the planning area during the life of this RMP. Resource potential and the affected environment for all types of renewable energy resources in the planning area are discussed below. Wind energy has the highest potential for development in the planning area, and is discussed in more detail than other renewable resources.

Wind Energy

The BLM completed a ROD for a Wind Energy Development Program in 2005 for the western United States (BLM 2005a). The ROD amended the Lander RMP by implementing Programmatic policies and BMPs for wind-energy development in the planning area. Subsequent policy (IM 2009-043) has provided additional guidance for wind-energy development on BLM-administered land. The BLM issues ROW grants for wind energy projects for: specific sites for meteorological towers, sites for meteorological towers and a project area (for the purpose of excluding other wind energy ROWs while site testing and monitoring is being completed), and for full wind-energy development.

Applicants may apply for ROW grants for one of the following types of wind energy projects:

- A site-specific wind energy site testing and monitoring ROW grant for individual meteorological towers, access to the sites, and instrumentation facilities with a term limited to three years.
- A wind-energy site testing and monitoring ROW grant for a larger site testing and monitoring project area, with a term of three years that may be renewed beyond the initial three year term.
- Long-term commercial wind-energy development ROW grant with a term that is not limited by the regulations but usually is in the range of 30 to 35 years.

Wind power classifications are used to identify wind resource potential based on wind power density at 50 meters above ground level. Wind power classes, as identified by the NREL, range from 1 (lowest) to 7 (highest) (Table 3.52, “Wind Energy Potential by Wind Power Class in the Planning Area” (p. 467)). The BLM wind energy PEIS determined which areas on BLM-administered lands have low (classes 1 and 2), medium (class 3), and high (wind power classes 4 to 7) potential for wind-energy development based on their wind power classification. Wind power is considered economical for large turbines (commercial utilities scale) at class 3 and higher, although a small noncommercial turbine can be used at class 1. Wind resource potential in the planning area varies from poor to superb (Table 3.52, “Wind Energy Potential by Wind Power Class in the Planning Area” (p. 467)). The majority of the planning area is rated as wind-power class 4 or lower. Less than 5 percent of the planning area is rated at wind-power classes 6 and 7.

Table 3.52. Wind Energy Potential by Wind Power Class in the Planning Area

Wind-Power Class	Resource Potential	Wind Speed (mph)	Planning Area Total		BLM-administered Surface	
			Acres	Percent	Acres	Percent
1	Poor	0-12.5	528,652	16	319,576	13
2	Marginal	12.5-14.3	658,185	20	423,753	18
3	Fair	14.3-15.7	969,347	29	718,339	30
4	Good	15.7-16.8	743,242	22	587,432	25
5	Excellent	16.8-17.9	307,888	9	240,402	10
6	Outstanding	17.9-19.7	120,210	4	88,195	4
7	Superb	> 19.7	23,365	<1	16,512	<1

Source: BLM 2005a; BLM 2012a

Note: The estimates have been validated by the National Renewable Energy Laboratory; however, the numbers are just measurements and should be confirmed by direct measurement.

< less than

mph miles per hour

BLM Bureau of Land Management

There are areas with high wind energy potential (mostly classes 5 and 6) in the south and southeast portions of the planning area in the Green Mountains south of Jeffrey City and in the Antelope Hills east of Atlantic City and South Pass City (Map 96). There are other areas with high wind energy potential (classes 5 and 6) along the Rattlesnake Range and in the north central portion of the planning area near the border of Hot Springs and Fremont Counties north of Shoshoni. Most of these high potential areas are closed due to designated NHTs and/or core greater sage-grouse habitat.

In addition to wind power class ratings, other factors influence the potential for wind-energy development in the planning area. Proximity to transmission lines to transfer energy produced at wind facility sites influences the potential for wind energy facilities. Protections to avoid adverse

impacts to other resources and resource programs also affect the potential for wind-energy development in the planning area. Large wind turbines are often considered a visual intrusion and affect the visual landscape. Adverse impacts to other resources and management objectives of resources can also be limiting factors to the development of wind energy resources. Other key factors affecting wind-energy development potential in the planning area are the Congressionally Designated National Historic and Scenic Trails and WSAs, which are excluded from development through the BLM wind energy PEIS.

In the planning area, there is currently one ROW grant for installation of meteorological towers for wind site testing and monitoring, which includes a project area (17,456 acres of BLM-administered surface) where no additional facilities are authorized (BLM 2009a). The authorization for the project area serves to exclude issuance of other wind ROW grants.

Solar Energy

The BLM processes solar energy ROW applications for lands under its Solar Energy Development Policy (BLM 2010d). The DOE's Energy Efficiency and Renewable Energy Program and the BLM are preparing a solar energy development PEIS to evaluate utility-scale solar energy development, to develop and implement Agency-specific programs that would establish environmental policies and mitigation strategies for solar energy projects, and to amend relevant BLM land use plans with the consideration of establishing a new BLM solar energy development program.

Although the PEIS does not specifically include Wyoming, policy direction, BMPs, and mitigation would likely be applied to any solar development projects in Wyoming.

There are no commercial level solar facilities or applications for commercial level solar facilities in the planning area. If any commercial or industrial level application were received, it would need to be evaluated to determine if it was within the reasonably foreseeable development considered in this RMP and EIS. If not, a plan amendment would likely be needed.

Based on the findings of the Renewable Resource Assessment Project (BLM and DOE 2003), there are no locations in the planning area that receive a high amount of solar insolation (6 kilowatt-hours per square meter per day or higher). As a result, the potential for development of solar resources in the planning area is unlikely. Advances in technology and policy direction encouraging the development of solar energy resources during the life of the RMP could improve the potential for solar development in the planning area; however, the widespread development of solar facilities is not likely.

Biomass Energy

Biomass power is obtained from the energy in plants and plant-derived materials, such as food crops and grassy and woody plants, residues from agriculture or forestry, and the organic component of municipal and industrial wastes. Biomass can be used for direct heating (such as burning wood in a fireplace or wood stove) and for generating electricity or it can be converted directly into liquid fuels to meet transportation energy needs.

There are currently no biomass facilities and no pending applications for biomass facilities in the planning area. The potential for biomass energy facilities in the planning area is low due to low precipitation, a short-growing season, allocation of grassland resources to livestock grazing, and minimal availability of commercial timber land. Increases in pine beetle kill timber could

raise the potential for biomass energy production in the planning area; however, large-scale use of beetle kill timber for biomass energy production is limited by the amount of timber land in the planning area.

Geothermal Energy

Geothermal resources are considered a fluid leasable mineral and are processed according to the provisions of the Mineral Leasing Act. Geothermal resources are discussed in the *Mineral Resources* section of this chapter.

Management Challenges for Renewable Energy

The potential development of wind energy resources presents a management challenge in the planning area. To increase efficiency and power production from wind energy, turbines are becoming increasingly taller and have larger footprints. The increased magnitude of these structures creates management challenges in meeting objectives for other resources caused by visual intrusions on the landscape, surface disturbance, and other associated impacts. Most high wind potential areas in the planning area are in close proximity to Congressionally Designated Trails and greater sage-grouse Core Area. Development of large wind turbines could create substantial adverse impacts to both Congressionally Designated Trails (due to visual impacts) and greater sage-grouse Core Area (due to disturbance during construction, habitat fragmentation, and increased predation from raptors perching on wind turbines).

An important management challenge associated with renewable energy resources is the ability to transmit power generated from renewable energy sources to the grid and to deliver it to the load centers. There is no excess capacity for transmitting power out of the planning area and the development of new power transmission lines in the planning area would increase management challenges associated with linear infrastructure development, such as disturbances to resources and increased demands on BLM personnel for ROW grants. Like wind turbines, power transmission lines include vertical structures, but also introduce a linear feature that can be particularly noticeable on a visual horizon on certain landscapes. Adverse impacts to other resources and resource programs from the development of renewable energy facilities can create additional management challenges.

3.6.3. Rights-of-Way and Corridors

Section 501 of FLPMA authorizes the BLM to grant ROWs for infrastructure and facilities that are in the public interest and require ROWs over, under, upon, or through BLM-administered lands. The BLM ROW program consists of the evaluation, authorization, and management of ROWs, including corridors, for a variety of uses on BLM-administered land. A ROW grant is an authorization to use specific pieces of public land for certain projects, such as developing roads, pipelines, and transmission lines. The grant authorizes rights and privileges for a specific use of the land for a specific period. A ROW corridor is an area with specific boundaries that has been designated as the preferred location for certain specific uses, while it excludes others. Land uses that typically do not require a ROW are those defined as “casual use” (43 CFR 3809.5). Casual use activities are those involving practices that do not ordinarily cause any appreciable disturbance to BLM-administered lands, resources, or existing improvements.

An important component of the ROW program is the intrastate and interstate transportation of commodities that are ultimately delivered as utility services (e.g., natural gas and electricity)

to residential and commercial customers. Equally important on the local level is the growing demand for legal access to private homes and ranches using ROW grants. While the majority of existing ROW actions in the project area are for linear facilities, there are also many existing site ROWs for non-linear communication sites, well pads, compressor sites, water reservoirs, and energy resource distribution and transmission.

Under current management, ROW corridors are not formally designated other than the Westwide Energy Corridor; however, areas are identified for avoidance by major utility ROWs (Map 101). The BLM and other agencies (DOE and the USFS) prepared a PEIS for the Designation of Energy Corridors on Federal Land in Eleven Western States. The PEIS evaluates potential impacts associated with the proposed action to designate corridors on federal land in 11 western states (including Wyoming) for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities. The ROD for the PEIS amended the existing Lander RMP by designating energy corridor 79-216 (Westwide Energy Corridor) as a multi-modal energy corridor. A small portion of energy corridor 79-216 runs through the northeast portion of the planning area in a northwest to southeast direction (Map 105); there are no other designated corridors in the planning area.

Although not in designated corridors, there are large-scale utility ROWs authorized in the planning area. These include three PacifiCorp transmission lines: one going over South Pass near Highway 28; one east-west in Township 35 North; and one east-west in Township 31 North. In addition, there is the Spence-Mustang-Jim Bridger line entering the planning area in Township 25 North, Range 94 West, and one along the Boysen Scenic Byway. Other larger ROWs have below ground pipelines but no above ground ROWs. Some of these are the Frontier/Anadarko pipeline through Beef Gap, the Colorado Interstate Gas pipeline going north-south through Beef Gap and eventually connecting with the Westwide Energy Corridor, the Beaver Creek CO₂ line (originally called the “Lost Creek” Spur), the Sand Draw pipeline, the Sand Draw to Casper pipeline, pipelines at various locations along Highway 20/26, and the Shoshoni/Badwater and the Lost Cabin/Pony Express pipelines that connect to the Westwide Energy Corridor. There are a number of pipelines in the Bairoil area, including one entering the planning area in Township 26 North, Range 91 West. Some of these pipelines are for the transmission of CO₂; others are for oil and gas products.

There are no pipelines along the Bison Basin Road, which is, like other county roads in the planning area, an authorized ROW with existing disturbance.

ROW avoidance in the planning area is identified for areas with the greatest potential conflicts. Areas currently designated as ROW avoidance areas are generally associated with existing ACECs. Within WSAs, existing ROWs may be renewed if they are being used for their authorized purpose. The existing plan identified six WSAs, including the Copper Mountain WSA, the Sweetwater Canyon WSA, and four WSAs in Sweetwater Rocks. In January of 1990, two additional WSAs, the Dubois Badlands WSA and the Whiskey Mountain WSA, were designated in the planning area. New ROWs in WSAs may be approved for temporary uses if they satisfy the non-impairment criteria (Section III. C. 3 of BLM H-8550-1).

The existing plan encourages ROWs to be co-located where possible. This practice also serves to meet the ROW program objective of protecting natural resources through limiting the proliferation of scattered ROWs. Co-location of ROWs encourages proponents to site facilities where there are similar existing authorized uses. Examples of this would be siting of a power distribution line (linear facility) along the alignment of an existing highway or pipeline ROW

(also linear). Although not formally designated as a ROW corridor, the Beef Gap area has been a concentration area for ROWs; however, there is no more ROW capacity in the Beef Gap area and the area is challenging for new underground pipelines going down below existing pipelines because of the thick layer of granite; Beef Gap is in reality a notch in the top of what was once a granite mountain range that subsided and was later almost covered by eroded material.

The BLM authorizes ROWs in the planning area for the development of powerlines, communication facilities, access roads, water-related facilities (wells and pipelines), and pipelines and ancillary facilities for the transportation and delivery of mineral-related commodities. A total of approximately 1,060 existing ROWs are authorized in the planning area (Table 3.53, “Existing Rights-of-Way in the Planning Area” (p. 471)). Roads, pipelines, and powerlines comprise the largest amount of ROW authorizations by type in the planning area.

Table 3.53. Existing Rights-of-Way in the Planning Area

Authorization Type	Number of Existing Right-of-Way Authorizations
Roads	272
Pipelines and Associated Sites	271
Powerlines and Associated Sites	262
Telephone and Fiber Optic Lines	92
Water Facilities, Ditches and Reservoirs	55
Federal Highway Administration Roads and Material Sites	74
Established Communication Sites (Multiuser)	3
Communication Use Authorizations	31
Total	1,060
Source: BLM 2009a	

Communication sites are authorized under a lease. Communication sites are typically a site ROW, which consists of facilities such as small buildings, towers, antenna and other structures. Communication site concentration areas are typically located on mountaintops, ridgelines, or other high elevation areas to allow uninterrupted transmission of the associated communication signal. There are approximately 34 communication site and use authorizations in the planning area (not including telephone and fiber optic lines). The existing plan did not identify preferred locations for communication sites in the planning area. Current management has authorized communication sites on a case-by-case basis; however, communication sites have been concentrated in four multiple owner-approved areas within the planning area including Horse Heaven, Cedar Rim, Crooks Mountain, and the Atlantic City/South Pass communication site areas (Map 105). Communication site plans have been prepared for each of these communication site areas. The plans govern specific development and management of communication sites in the area. Regularly updated information on communication site facilities, concentration areas, links to site plans and other information for communication sites in the planning area can be found on the BLM website at <http://www.blm.gov/commsites/>.

Whiskey Mountain is the location of a communications facility that has been in place since 1963. It currently consists of a 32-foot tower with two 12-foot antennas and an approximately 18-foot by 19-foot building housing radio and alarm equipment, and a power source. The facility is part of the microwave system carrying radio traffic throughout Wyoming, including a route starting in Casper and continuing to Jackson. The facility was located some years prior to the original designation of the Whiskey Mountain ACEC or the formal recognition of the importance of the area as bighorn sheep habitat (Qwest Corporation 2011).

The facility provides diversity protection for numerous critical circuits, including 11 Federal Aviation Administration circuits, SS7 trunks supporting switch communications, and 911 service. The facility is an important component for operations provided by the Dubois Telephone Exchange, including 911 or county-wide emergency medical service, and diverse routing opportunities (Qwest Corporation 2011).

In 2006, the Dubois Telephone Exchange completed a fiber optic service from Casper to Dubois, which allowed a variety of modern services to the local community. However, the facility on Whiskey Mountain continues to provide the diversity of service that is both critical to operations and mandated by a variety of regulatory agencies.

It is likely that the fiber optic network will extend west from Dubois over Togwotee Pass to Jackson, thus creating a large fiber optic “ring” serving approximately two-thirds of the state of Wyoming (Dubois Telephone Exchange 2011). A completed ring would protect all network traffic (such as broadband, voice, and emergency medical service) with the diverse or redundancy services required. For this ring to be completed, a “business case” or economic justification would be necessary because of the private investment required (Dubois Telephone Exchange 2011).

In the past 10 years, regional demand for ROWs on BLM-administered land in the planning area has increased (BLM 2009a). Much of this demand has focused on conveyance of energy products through and from the sparsely populated western states to population centers, most recently dominated by west coast power demands. The upsurge in exploration and development of fuels such as natural gas has resulted in the need for more pipelines and higher pipeline capacities. Technological advancements have also resulted in new demands on public land, largely related to wind energy and communication sites for telecommunications (e.g., cellular and fiber optic).

Under the current rate of development, areas where there are major ROWs in common could become more heavily used. Crowding is not anticipated (BLM 2009a), although there are certain areas of capacity limitation such as in the Beef Gap area. Designation of ROW corridors would serve to protect natural resources by identifying areas where installation of new major ROWs would result in the least impacts to sensitive resources.

If the current rate of development continues and there is no additional electrical generation, the existing transmission infrastructure is expected to adequately meet future needs over the next 10 to 20 years (BLM 2009a). Existing electrical power transmission infrastructure is considered inadequate to support additional utility-scale power generation in the planning area. In the event utility-scale power facilities are developed in the planning area, there would likely be a need to upgrade or construct new transmission lines to distribute the generated electricity (BLM 2009a). Due to the interest the Lander Field Office is experiencing in ROW grants for wind site testing and monitoring, there is potential for limited utility-scale wind-energy development (discussed in more detail in the *Renewable Energy* section), which would most likely require additional transmission infrastructure. Natural gas pipeline capacity is also limited in some areas, and depending on the future development of mineral resources, there could be a need for new natural gas pipelines in the planning area (BLM 2009a).

Management Challenges for Rights-of-Way

Management challenges for ROWs include meeting national and regional demands for energy, telecommunications, and other services while balancing management objectives for other resources. The lack of designation of ROW corridors in the existing plan has presented management challenges.

Disturbance and resource impacts associated with ROW authorizations and the development that they allow creates management challenges in reaching management objectives for other resources and resource uses. Major infrastructure associated with ROW development, including large high-voltage transmission lines and wind turbines, creates a variety of adverse resource impacts, including impacts to visual resources, soil erosion, habitat fragmentation, and disturbance of greater sage-grouse habitat.

The central location of the planning area in Wyoming creates additional management challenges associated with disturbance from the development of large high-voltage transmission lines (and other intrastate and interstate linear infrastructure development). There are currently at least seven proposed major transmission lines (345 or more kilovolts) under consideration in Wyoming to support nationally reliable energy infrastructure and facilitate the development and transmission of renewable energy (WIA 2009). Due to the central location of the planning area, it is likely that at least a few of these major transmission lines will pass through the planning area to deliver energy from production areas in Wyoming and the Great Plains states to load centers in other western states.

Another management challenge for ROWs has been created by recent planning efforts in adjacent BLM field offices, specifically the Casper Field Office and the Rawlins Field Office. Through RMP revisions, these field offices have designated ROW corridors that terminate at the Lander Field Office planning area boundary, where the Lander Field Office has not designated corridors (Map 105) and is unlikely to because of serious resource conflicts such as Congressionally Designated Trails and historic sites. The Lander Field Office is working with the Bighorn Basin RMP plan revision and the Rock Springs Field Office to better coordinate adjoining land management. This constitutes a major planning gap between BLM field offices that limits the ability for proponents to gain connectivity for facilities and energy infrastructure. As ROW applications for linear infrastructure to transport energy and other commodities increase in Wyoming, the lack of consistency and location of ROW corridors between field offices increases processing time and creates inefficiencies for both the BLM and private sector clients.

Increased demand for ROW authorizations and the management challenges described above place limitations on the ability of BLM personnel to process ROW applications in a timely manner, to conduct other lands and realty related actions, and to fulfill other BLM responsibilities. Management challenges associated with increased ROW applications and other demands on BLM personnel are expected to increase in the future.

3.6.4. Comprehensive Trails and Travel Management

Travel and transportation are a part of virtually every activity on BLM-administered public lands, including recreation, livestock management, wildlife management, management of commodity resources, ROWs to private in-holdings, maintenance of electronic sites, and management and monitoring of public lands. The transportation network on public lands in the planning area consists of federal and state highways, county roads, and roads built to facilitate industrial and commercial development (Map 81). Map 82 through Map 85 show the detailed transportation network in and around Jeffrey City, Lander, Lysite, and the Dubois areas.

Comprehensive trails and travel management is the proactive management of public access, natural resources, and regulatory needs to ensure consideration of all aspects of road and trail system planning and management. This includes resource management, road and trail design, maintenance, and recreational and nonrecreational uses of the roads and trails. Travel in the

context of comprehensive trails and travel management incorporates access needs and the effects of all forms of travel, both motorized and nonmotorized. Comprehensive trails and travel management planning involves providing specific direction on the proper levels of land and water access for all modes of travel. Travel management objectives are the foundation for appropriate travel and access prescriptions.

Travel Management Designations

All public lands are required to have travel management designations. Federal regulations (43 CFR 8342.1, designation criteria) state that “the Authorized Officer shall designate all public lands as either open, limited, or closed to off-road vehicles. All designations shall be based on the protection of the resources of the public lands, the promotion of the safety of all the users of the public lands, and the minimization of conflicts among various uses of the public lands.” Subsequent travel guidance at the national level (e.g., the OHV management strategy [BLM 2001], the mountain bike action plan [BLM 2002b], and a nonmotorized/nonmechanized management strategy [in development]) has provided the BLM direction to proactively apply these designations to all forms of travel (mechanized and other forms of nonmotorized travel) where necessary to conserve natural resources while providing for ample recreation opportunities (BLM Manual 1626 - Travel and Transportation Manual and BLM Handbook 8342 - Travel and Transportation Handbook).

A travel management plan is not intended to provide evidence bearing on or addressing the validity of any Revised Statute (R.S.) 2477 assertion. R.S. 2477 rights are determined through a process that is entirely independent of the BLM's planning process. Consequently, travel management planning should not take into consideration R.S. 2477 assertions or evidence. Travel management planning should be founded on an independently determined purpose and need that is based on resource uses and associated access to public lands and waters. At such time as a decision is made on R.S. 2477 assertions, the BLM will adjust its travel routes accordingly.

Open

Lands designated as open are available for travel, on or off established roads and vehicle routes, as long as this activity does not cause unacceptable levels of resource damage. Areas are designated as open to motorized travel based on analysis that determines there are no compelling resource protection needs, user conflicts, or public safety issues to warrant limiting cross-country travel. Demand for open areas in the Lander Field Office tend to be in locations close to towns. Potential does exist to explore options to manage open areas in the Coal Mine Draw area and lands outside of the town of Dubois.

There are no areas currently open to motorized travel in the planning area. The 1987 RMP did not limit, restrict, or close any areas to mechanized or nonmotorized travel. Therefore the entire planning area is open to mechanized and nonmotorized travel. This has proven to create resource conflicts especially where repeated use or illegal development results in creation of a trail. With trail development comes increased conflicts with natural resources and increased conflicts amongst users. Areas that are open to mechanized travel include Johnny Behind the Rocks/Blue Ridge, Sweetwater Mining District, Sinks Canyon Climbing Area, the Bus @ Baldwin Creek, and the Dubois Mill Site.

Limited

Motorized vehicle travel within specified areas and/or on designated routes, roads, or trails is subject to restrictions (see the Glossary for definitions of route, road, and trail). The “limited” designation is used where OHV use must be restricted to meet specific resource management objectives. Examples of limitations include number or type of vehicles; time or season of use; permitted or licensed use only; use limited to designated roads and trails; or other limitations if restrictions are necessary to meet resource management objectives, including certain competitive or intensive use areas that have special limitations (see 43 CFR 8340.05).

Limited to Existing Roads and Trails

Travel is limited to existing roads and trails on approximately 2,226,504 acres of BLM-administered surface. This designation was created to allow travel without increasing the number of acres disturbed by route creation. Unless otherwise noted, the BLM manages travel in the planning area as limited to existing roads and trails. In areas (and only in these areas) where motorized travel is limited to existing roads and trails, the BLM makes exceptions for the performance of necessary tasks requiring the use of motor vehicles (e.g., picking up big game kills, repairing range improvements, managing livestock, and mineral activities). This necessary task exemption has resulted in the creation of numerous new roads especially in areas receiving repeated travel for maintenance purposes (fence lines, salt licks, etc.). This RMP will clarify the process for receiving exemptions from travel restrictions and clarify what actions constitute a necessary task.

Field observations, documented increases in road densities, and public feedback has indicated that the ‘limited to existing’ designation has not reduced route proliferation nor adequately mitigated travel conflicts with other resource values. The limited to existing designation has three major shortcomings: 1) the designation is hard to enforce, 2) the 1987 RMP provided no point of reference as to what constituted an existing road or trail, and 3) the ‘limited to existing’ designation does not lend itself to management scenarios where managers can adjust the travel network to better achieve land use planning goals and objectives. Some areas where conflicts have arose as a result of the ‘limited to existing’ designation include: East Fork, the Beaver Rim ACEC, NHT area, the Sweetwater Mining District, South Pass Historic Mining Area, Johnny Behind the Rocks/Blue Ridge, and areas adjacent to WSAs.

Some of these shortcomings associated with the ‘limited to existing’ designation will be addressed through this planning process. An inventory of existing roads and trails will be included in the Approved RMP and ROD.

Limited to Designated Roads and Trails

Motorized vehicle use is limited to designated roads and trails on approximately 163,075 acres of BLM-administered surface, primarily in environmentally sensitive areas. In addition, motorized travel is limited to designated roads and trails in the following locations: Lander Slope, Red Canyon, Green Mountain, and Whiskey Mountain. Travel in WSAs (with the exception of the Dubois Badlands WSA which is closed to motorized vehicles) is limited to the roads and trails that existed at the time the area became a WSA. This applies to both motorized and mechanized transport.

Seasonal and Over-Snow Closures

A number of locations in the planning area are generally limited to designated (or occasionally existing) roads and trails, but also have a seasonal closure or restrictions for part of the year

(111,002 acres of BLM-administered surface). These seasonal restrictions are designed to protect the values of other resources such as crucial wildlife winter range. Areas limited to designated roads and trails but subject to seasonal closures include Lander Slope, Red Canyon, Whiskey Mountain, and Green Mountain (closed December 1 through June 15). Additional seasonal restrictions may be necessary to protect sensitive resource values. This is especially true in wildlife winter concentration areas.

The Red Canyon area is closed to all forms of over-snow travel. The remainder of the planning area is open to over snow vehicle travel (2,379,481 acres of BLM-administered surface).

Closed to Motorized Vehicle Use

Approximately 5,923 acres of BLM-administered surface in the planning area are closed to travel. Closed means an area is closed to all motorized travel, with exceptions granted by the Authorized Officer only for emergencies, firefighting, public safety, or related incidents. A closed designation might also exclude nonmotorized or mechanized travel. Areas are closed in order to protect resources, ensure visitor safety, or reduce user conflicts. The Dubois Badlands WSA and portions of the Castle Gardens area are closed to motorized travel. Additional areas closed to motorized vehicles may be necessary in order to meet public demand for quiet recreational areas. In addition closures to mechanized travel may be necessary to protect resources, especially in light of the spread and amount of user created mountain bike trails. These trails are often located in areas where the trail and associated use stands to directly conflict with other resource values (wildlife, cultural resources, etc.).

Travel Management Areas

All public lands are placed in travel management areas. Travel management areas address acceptable modes of access and travel. They are also used to prescribe objectives for allowing travel in the area and setting characteristics that are to be maintained. Travel management plans identify the appropriate network of roads and trails, including nonmotorized access, in travel management areas.

The current RMP limits motorized travel to designated roads and trails in the Whiskey Mountain, Lander Slope/Red Canyon, and Green Mountain areas. Implementation was never completed for these areas because all designated roads and trails were not identified. The current RMP does not restrict or limit mechanized or nonmechanized travel in any travel management area. Table 3.54, "Travel Management Designations in the Planning Area" (p. 476) summarizes the travel management designations for the planning area.

Table 3.54. Travel Management Designations in the Planning Area

Area	Designation	Acreage	Notes
Lander Slope/Red Canyon	Limited to designated roads and vehicle routes. Seasonal closures to protect wintering wildlife December 1 to June 15.	~40,000	Implementation was not fully completed to identify the designated roads/routes. Seasonal closures have been implemented; however, adjacent land and route managers (WGFD, state and county governments) currently implement

Area	Designation	Acreage	Notes
			contrasting seasonal closures.
Green Mountain	Limited to designated roads and vehicle routes. Seasonal Closures to protect wintering wildlife December 1 to June 15	~56,000	Implementation was not fully completed to identify the designated roads/routes.
Whiskey Mountain	Limited to designated roads and vehicle routes. Seasonal Closures to protect wintering wildlife December 1 to June 15	~8,390	Implementation was not fully completed to identify the designated roads/routes. Acreage also includes lands acquired in exchanges in the 1990s (post-1987 RMP).
Castle Gardens	Closed	78	Archeology/Recreation site
Dubois Badlands	Closed	~4,520	Public lands within the Wilderness Study Area
Desert Yellowhead, Critical Habitat	Closed	360	To protect habitat for Desert Yellowhead, a Threatened plant species.
All other public lands in the planning area	Limited to existing roads and vehicle routes.	~2,200,000	Several specific roads were closed through Federal Register Notice procedures (Rocky Ridge Historic Trail Corridor).
Source: BLM 1987b			
RMP Resource Management Plan			
WGFD Wyoming Game and Fish Department			
~ approximately			

At present, the BLM has completed route inventories for Green Mountain, Lander Slope, the Dubois Badlands WSA, Whiskey Basin, and the Sweetwater Canyon WSA. The BLM is using existing route inventories and data from remote sensing to fully implement travel management designations in a number of other areas.

Primary Travelers and Modes of Travel in the Planning Area

Public land users employ roads and trails for a variety of recreational and utilitarian activities. Nonmechanized modes of travel include cross-country skiing, dog sledding, snowshoeing, horseback riding, hiking, boating, hang-gliding, paragliding, and ballooning. Mechanized vehicles predominantly involve mountain bikes and specialized equipment such as mountain skateboards. Motorized travel includes standard passenger vehicles on maintained roads and OHVs on primitive roads and trails. OHVs include all motorized travel devices such as motorcycles, all-terrain vehicles, jeeps, specialized 4 x 4 trucks, over-snow vehicles, and motor boats.

In addition to federal and state highways, county roads, and other roads for commercial and industrial purposes, public land users employ a road network consisting of BLM-maintained roads that are regularly maintained, ditched, and crowned gravel roads, as well as roads and vehicle routes that were never formally constructed and rarely receive maintenance. Many of these latter roads are two-track vehicle trails that were created (pioneered) by public land users and are maintained simply by the passage of motor vehicles. These routes were not purposefully designed and, as a result, vary greatly in condition and stability. Limited enforcement of travel restrictions, high levels of use, and improvements in mechanized and motorized vehicle technology have increased the number of user pioneered routes in recent years. This network of two-track roads

and trails is important for recreational and ranching uses of public lands. There are approximately 2,400 miles of routes, for an average density of 2.7 miles of routes per square mile. Almost 90 percent of these routes are open to motorized travel.

The most popular areas for motorized recreational travel are Coalmine Draw, Dubois Badlands, Shoshoni Lake Road, and to a lesser extent, the Sand Draw area. This use occurs nearly year-round, and for many users the act of recreational driving is the primary reason for their visit. Most of these visitors live within an hour's drive of the area and enjoy practicing their technical skills, using their equipment, and spending time with family and friends. During the autumn hunting season, most parts of the planning area experience increased motorized travel. Much of this use is focused in the Lander Slope, Red Canyon, South Pass, Green Mountain, and Dubois areas. These tend to be destination hunting areas, with visitors coming from other parts of Wyoming and the greater Rocky Mountain region.

In addition to heavier OHV use, increased urbanization on adjacent private lands has created additional nonmotorized use and new expectations for recreation experiences. BLM-administered lands close to expanding urban areas provide convenient areas for recreation including hiking, mountain biking, dog walking, and rock climbing. Mountain biking and casual hiking (as opposed to destination hiking) has become very popular at Johnny Behind the Rocks, Baldwin Creek, Red Canyon, and the Dubois Badlands.

Management Challenges for Comprehensive Trails and Travel Management

As is the case throughout the western United States, OHV use has increased dramatically since the approval of the existing plan. Lands that once did not experience impacts because of light use now commonly experience damage to cultural resources and impacts to recreation. Travel routes, especially user pioneered routes, are often unsustainable and can cause resource damage. Environmental concerns associated with OHV use include a loss of soil and damage to vegetation due to surface disturbance, the creation of scars on hillsides, habitat loss, disturbance of wildlife in crucial habitats such as winter ranges, siltation of streams due to erosion from roads and trails, and degradation of scenic qualities.

Nonmotorized use and new expectations for recreation experiences have increased in areas adjacent to private lands with expanding urbanization. Many of these users recreate on BLM-administered surface because the lands are close to home and provide a convenient place to exercise, relieve stress, or spend time with family and friends. Until recently, there has been little demand, and consequently few resources allocated for nonmotorized recreation travel. This type of use has been increasing in all of the public lands bordering municipalities. The towns of Lander, Riverton, and Dubois have all experienced population growth. Subsequently, the public lands adjacent to these towns have the highest incidence of nonmotorized use. At times, these uses and expectations conflict with the experiences desired by motorized users.

Correlated with the growth of communities is the subdivision of private lands adjacent to BLM parcels and subsequent issues of trespass and access restriction. Often, BLM-administered lands are isolated and provide limited public access. In these instances, enforcement of travel restrictions is difficult, and motorized trespass can frequently occur from adjacent private land. Subdivisions are generally not designed to give public access to the BLM-administered lands, which can limit access to isolated parcels of public land. However, it has been observed that often the new community provides stewardship to the adjacent lands, potentially making BLM monitoring and management more efficient.

Many areas used by recreationists do not have trails that were built with recreation experiences in mind. The types and amounts of use and the location of roads and trails influence the physical, social, and administrative recreation setting and the overall quality of the recreation experience. Most routes in the planning area either follow historic nonrecreational routes or were created when OHV users repeatedly drove cross-country. Many other routes were constructed to create access to public land improvements and projects for timber/vegetation management, gas/mineral development, range management, and various ROWs. Permittees maintain some of these roads to ensure access to improvements such as livestock/wildlife ponds or fences. Numerous roads were not necessarily intended to be left open for recreational use but have become popular routes for visitors engaged in mechanized/motorized recreation activities. In many cases, the roads and trails available do not provide desirable recreation experiences. Increased transportation demands by nonrecreational uses (e.g., oil and gas exploration and grazing) have also affected recreational travel in some areas. Recreation experiences can suffer when transportation systems for other uses are increased or created.

3.6.5. Livestock Grazing Management

The BLM is responsible for administering livestock grazing on BLM-administered land. Livestock grazing is the grazing of domestic animals (cattle, sheep, horses, and goats) and is one of the most visible and established uses of BLM-administered lands. For most operators, holding a BLM grazing permit or lease provides an important component of their overall ranching operations. Grazing on public land provides forage for livestock during a crucial time of year when base ranch operations are being used to grow forage for the winter months. Livestock grazing is an authorized, discretionary use of public lands by individuals who qualify to hold a grazing permit/lease under federal grazing regulations.

Prior to 1934, the General Land Office managed grazing on public lands outside forest perimeters. Comprehensive management of these lands was initiated in 1934 when Congress passed the Taylor Grazing Act. The Grazing Service was established and charged with implementing the provisions of the Act. Specific tasks included establishment of a permit/lease system, organization of grazing districts, fee assessment, and consultation with local advisory boards.

In 1946, the Grazing Service and General Land Office merged to form the BLM. The Taylor Grazing Act was the principle legislation used to administer livestock grazing on public lands until 1976 when Congress passed the FLPMA. The Public Rangelands Improvement Act of 1978 (43 U.S.C. § 1901-1908) established a grazing fee formula that sets and adjusts annual fees for grazing on public land.

In 1985, the BLM established three categories for allotments to identify areas that needed management and to prioritize workloads and the use of range improvement dollars. The BLM categorized allotments as Improve Existing Resource Conditions (I), Maintain Existing Resource Conditions (M), or Custodial Management (C). Appendix K (p. 1547) includes the criteria for placing allotments into these three categories and a complete list of allotments in each of the categories for the planning area.

In August 1995, new regulations changed the BLM administrative procedures to manage public lands. These regulations directed the establishment of standards and guidelines for rangeland health to achieve properly functioning ecological systems for both upland and riparian-wetland areas. The Standards for Healthy Rangelands & Guidelines for Livestock Grazing Management

for the Public Lands Administered by the BLM in the State of Wyoming were submitted to the Secretary of the Interior in July 1997 and approved on August 12, 1997 (Appendix J (p. 1537)).

Approximately 97 percent of the public lands in the planning area are available for livestock grazing (Map 117). The other 3 percent are primarily lands in highway easements, very rocky areas, and areas that have been mined and have little vegetation. Oil and gas development and associated infrastructure (roads, pipelines) has contributed to the reductions in surface area available for grazing. A few allotments have been closed to livestock grazing because of other land use priorities, such as the bighorn sheep wintering areas in Dubois.

Livestock grazing in the planning area consists primarily of cattle, but also includes sheep and horses (Table 3.55, “Livestock Grazing Permits and Leases on BLM-Administered Lands in the Planning Area” (p. 480)). Goats have sometimes been authorized, primarily for the purposes of suppressing invasive plant species.

Table 3.55. Livestock Grazing Permits and Leases on BLM-Administered Lands in the Planning Area

Livestock Use Category	Number of Permits	Number of Leases
Cattle	129	34
Cattle and Sheep	6	4
Cattle, Sheep, and Horses	8	-
Horses	1	17
Cattle and Horses	27	10
Cattle and Goat	1	-
Total	172	65
Source: BLM 2009a		
BLM Bureau of Land Management		

Stock driveways were authorized under the Stock Raising Homestead Act of 1916, and created by a Secretarial Order for the specific purpose of creating trailing routes and reserving water sources for trailing livestock. Stock driveway withdrawals prohibit disposal of these lands.

Private agricultural lands adjacent to BLM and USFS lands in the planning area often provide critical winter range, migration routes, and breeding grounds for key wildlife species.

Conservation easements are becoming more prevalent in the planning area. These types of easements promote the conservation of important wildlife habitat and open space. For example, The Nature Conservancy recently acquired a 1,225-acre tract of land along the Lander Front, which provides crucial yearlong habitat for deer, elk, and moose, as well as summer range for pronghorn and core breeding and nesting habitat for the greater sage-grouse. Prior to selling the tract of land to a local agricultural producer, The Nature Conservancy placed a conservation easement on the land.

Several of the livestock grazing operators in the planning area also participate in the WGFD Walk-in Hunting Areas program that provides public hunting opportunities on private lands (WGFD 2012).

Grazing Allotments and Animal Unit Month Allocations

The BLM authorizes grazing preference under two different sections of the Taylor Grazing Act, Section 3 and Section 15. Grazing preference means a priority position against others for

the purpose of receiving a grazing permit or lease. Section 3 permits are authorizations to graze areas within the original grazing districts as established in 1934. Section 3 allotments are usually larger, contiguous tracts of land and incorporate unfenced state and private lands. A portion of the grazing fees from these permits is available for investment in range improvements on the Section 3 allotments.

Section 15 allotments are leases, not permits, and are generally small parcels outside the original grazing districts. The majority of grazing leases in the planning area are located on the Lander Slope and the Dubois area. These leased parcels provide little opportunity for intensive grazing management due to their size, access and isolation from other BLM-administered lands. Although Section 15 leases are small and isolated, they generally tend to provide important wildlife habitat and recreational opportunities within the Lander Slope and town of Dubois. Section 15 lessees pay the same grazing fee as Section 3 allotments, but funds are generally not used for range improvements on Section 15 leases due to their small size and little benefit to be obtained from additional infrastructure. Much of the Section 15 leases already are fenced.

Forage is allocated based on the carrying capacity of the land. Carrying capacity reflects the maximum level of grazing public lands can sustain over the long term. A more specific definition of carrying capacity is “livestock carrying capacity,” which means the maximum stocking rate possible without inducing damage to vegetation or other resources values. Carrying capacity can vary from year to year on the same area due to fluctuating forage production. In addition, available forage for livestock grazing varies with changes in climatic conditions, forage production, and the availability of water.

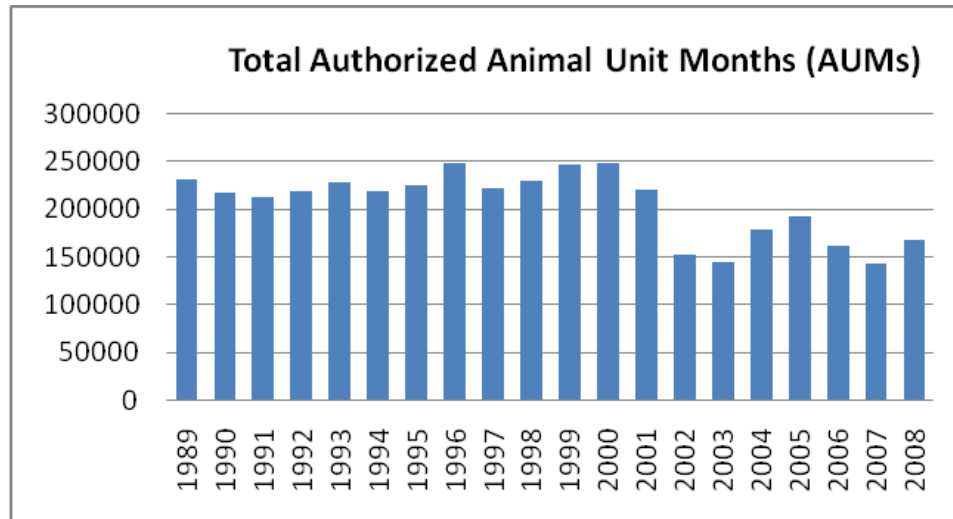
The BLM administers livestock grazing on 310 allotments covering 2,334,711 acres of BLM-administered surface lands and 279,000 AUMs allocated within the planning area (BLM 2009a) (Map 117). An AUM is the amount of forage necessary to sustain one cow and her calf or its equivalent for a period of one month. The AUM levels were allocated during the 1930s and adjustments were made from the 1940s through 1960s. Adjustments in allotment carrying capacities since the late 1970s have been based on long-term monitoring, allotment evaluations, and most recently Standards and Guidelines Assessments.

The size of grazing allotments in the planning area ranges from 40 acres to more than 500,000 acres of public land (Appendix K (p. 1547)). Collectively, 24 of the largest allotments within the planning area are categorized as “common allotments” that are grazed by livestock owned by several permittees. Examples of some of these common allotments include the Green Mountain, Granite Mountain and Silver Creek allotments. Managing grazing on these lands can have more of a beneficial outcome because the allotments tend to have a large percentage of public lands within their boundaries. Allotments in which public lands provide only a minority of the forage are more difficult to manage because BLM prescriptions can only be applied to public lands.

The large allotments generally provide spring, summer, and fall forage for local operators and are important to their operations as livestock move from winter feed grounds or pastures, to summer pastures. Winter and early spring use does occur in limited areas east of Boysen Reservoir and northeast of Shoshoni.

Portions of some allotments may be unsuitable for grazing due to resource conflicts, terrain, lack of forage, distance from water, and other factors. Although there has been no overall reduction in the number of allotments since the 1986 RMP ROD was approved, conditions on the ground have generally not supported authorizing full AUMs. The BLM management focus is directed toward achieving and maintaining rangeland health.

Since 1989, the number of AUMs authorized (Appendix K (p. 1547)) has been approximately 73 percent of the permitted AUMs. Some of this is a result of the negotiated and voluntary reductions due to a prolonged drought. The downward trend in permitted AUMs coincides with a decrease in actual cattle numbers in Fremont County during times of drought. Figure 3.19, “Total Authorized Animal Unit Months in the Planning Area, 1989-2008” (p. 482) shows the authorized AUMs in the planning area from 1989 through 2008.



Source: BLM 2009a

Figure 3.19. Total Authorized Animal Unit Months in the Planning Area, 1989-2008

Allotment Management Plans and Rangeland Management Agreements

AMPs and rangeland management agreements have been used to improve rangeland health through detailed planning, monitoring, and implementation. AMPs or rangeland management agreements have been developed for 52 allotments covering 790,346 acres of BLM-administered surface (Appendix K (p. 1547)). Most were developed in the 1980s and 1990s. These allotments were prioritized for developing site-specific objectives and implementing management changes.

Rangeland Health/Productivity

The existing plan placed all allotments in the following categories “I” (Improve), which includes most of the large allotments, “M” (Maintenance), and “C” (Custodial). The BLM used these classifications to identify areas with a potential need for management to prioritize workloads and use of range improvement dollars. The BLM placed allotments containing larger tracts of public land with natural resource issues in the I and M categories, and allotments containing smaller tracts of public land with little to no resource issues in the C category. The BLM gave priority for managing these allotments to category I allotments, followed by category M allotments. There are a total of 123 category I allotments, 83 category M allotments, and 82 category C allotments in the planning area (BLM 2009a). Some allotments would not change category because resource uses, values, and issues will not change. Although management might have been implemented on an allotment, the allotment could remain in category I because it might present resource concerns such as crucial wildlife winter range (Appendix K (p. 1547)).

The BLM uses a number of methods to evaluate rangeland health, which could reveal trends in the composition of the plant community or productivity of a plant community. Some methods

yield qualitative data; others are quantitative. Rangeland is monitored throughout the planning area as part of the rangeland health assessment process.

Many allotments are managed under AMPs or agreements which include grazing rotations and authorized season of use. These are designed to meet soil cover and desired plant species growth requirements. Observations of old headcuts, roads, and other disturbances show that perennial plant species have increased once non-livestock disturbances end. Generally, these observations have been confirmed in the rangeland health determinations completed to date. Where livestock grazing has been identified as the causal factor for not meeting rangeland health standards, appropriate actions to correct the problem have been implemented. However, disturbance related to other ongoing resource uses, including oil and gas development and mining, could affect adjustments.

Additional factors other than rangeland health are changing the face of public land grazing in the planning area. Since 2000, the BLM has experienced a larger than normal turnover in permits/leases. These permits/leases tend to be purchased by both traditional and nontraditional ranching interests, with the latter averaging about 25 percent of total permits/leases authorized.

Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management

In 1998, the Lander Field Office began assessing rangelands for consistency with the Standards for Healthy Rangelands and Guidelines for Livestock Grazing Management for the Public Lands administered by the BLM in the State of Wyoming (Wyoming Standards for Healthy Rangelands) (Appendix J (p. 1537)), as consistent with revisions to the 43 CFR 4100 grazing regulations. The purpose of the standards and guidelines is to provide a measure (Standards) to determine land health, and methods (Guidelines) to improve the health of the public rangelands. While originally conceived to evaluate the impacts of grazing on public lands and to identify where current grazing management might be contributing to failure to meet the Wyoming Standards for Healthy Rangelands, the focus has expanded to include impacts from all resource uses on public lands. An interdisciplinary team conducts the assessments to address the six standards.

The standards are intended to help the BLM and public land users focus on a common understanding of acceptable resource conditions, and the guidelines provide a basis for working together to achieve that vision. The standards are used to communicate current and desired resource conditions among various groups, and guidelines are used to describe or communicate methods for managing activities to achieve those desired conditions.

The Wyoming Standards for Healthy Rangelands address the health, productivity, and sustainability of BLM-administered public rangelands and represent the minimum acceptable conditions for the public rangelands. The standards apply to all resource uses on public lands and ensure that management of resources of particular concern to ecosystem health do not degrade the quality of rangelands (soils, riparian-wetland areas, upland vegetation, rangeland management, water quality, and air quality). Their application is determined as use-specific guidelines are developed. Standards can be synonymous with goals and are observed on a landscape scale.

The Wyoming Standards for Healthy Rangelands describe healthy rangelands rather than rangeland byproducts. The achievement of a standard is determined by observing, measuring, and monitoring appropriate indicators. An indicator is a component of a system whose characteristics (e.g., presence, absence, quantity, and distribution) are observed, measured, or monitored based

on sound scientific principles as identified in the Wyoming Standards for Healthy Rangelands. Indicators associated with each standard are identified in Appendix J (p. 1537).

In general, rangeland health throughout the West has improved since the 1930s. However, the BLM has acknowledged that nationally, rangeland health is not at its potential. It was for this reason that the Wyoming Standards for Healthy Rangelands were adopted by the BLM (Appendix J (p. 1537)).

Rangeland health assessments have been ongoing in the planning area from 1998. As of 2011, approximately 107 grazing allotments and 1,019,044 acres have been assessed. Of the 107 allotments assessed, 71 allotments (266,537 acres) are meeting or making substantial progress toward meeting the standards (Appendix K (p. 1547)). For allotments that were determined not to meet standards because of livestock grazing, corrective action was put in place. These allotment issues are addressed in site-specific range permit renewal NEPA actions.

Since 2009, the BLM adopted a landscape or block approach to doing health assessments by grouping similar types of allotments. Initially, 11 livestock blocks were identified: Block 1 Bridger Mountains; Block 2 Badwater; Block 3 Muskrat Basin or “below the Rim”; Block 4 South Pass-Upper Sweetwater; Block 5 Lander Slope; Block 6 Dubois; Block 7 Upper Beaver Creek; Block 8 Rattlesnake Range; Block 9 Gas Hills or “above the Rim”; Block 10 Sweetwater River; Block 11 Green Mountain-Whiskey Basin. These names and numbers are identifiers and not a determination of priority for assessments or to be unchanging boundaries. The order of priority of health assessments will be determined by the expiration date of the existing livestock grazing permit (lease) and then by order of resource priority, including greater sage-grouse and riparian-wetland health.

Through 2011, the Dubois and Bridger Mountain blocks were assessed. All 23 allotments in Dubois (26,523 acres) met standards, and the livestock grazing leases were reissued. Of the 20 Bridger Mountain block allotments (34,800 acres), 6 allotments (2,627 acres) were meeting standards and 14 allotments (32,173 acres) were not meeting standards. Part of the standards assessments is to determine why the allotment did not meet standards (causal factor); this determination has not yet been made. Two of the allotments found not to be meeting standards were meeting standards when they were evaluated in 1998, as identified in Appendix K (p. 1547). In the summer of 2012, health assessments were being done in the South Pass-Upper Sweetwater block. The assessments have not been completed as of the date of this writing. The tentative order for completing the blocks is Blocks 5 and 7, Block 10, Block 9, Block 11, and Block 2.

Appropriate actions to correct problems related to livestock grazing are implemented in allotments that have been assessed if it is found that the allotment does not meet the Wyoming Standards for Healthy Rangelands. Appropriate actions may include development of range improvements and/or prescribed grazing, which may or may not be part of an AMP or rangeland management agreement. Changes in livestock management practices within that allotment are implemented as terms and conditions in accordance with 43 CFR 4180.2(c)(2). In most allotments that failed an assessment of standards, not all of the public lands in the allotments were considered to be failing. Additionally, most of these standards were not met for reasons other than current livestock management, such as historic livestock grazing use, motorized travel, oil field development, and mineral extraction. In accordance with Standard 4, where current livestock grazing management has been identified as contributing to an allotment failing the Wyoming Standards for Healthy Rangelands, the guidelines for livestock grazing management are used to direct new grazing management stipulations for the allotment (Appendix J (p. 1537)).

Of the rangelands that are not meeting the standards or not making acceptable progress because of livestock grazing, 11 allotments (584,195 acres) now have AMPs designed to ensure progress toward meeting the standards. Not all of the implemented AMPs have been effective in achieving rangeland health. In some cases, there has been insufficient monitoring to determine what impacts range improvement projects and changes in livestock grazing management have had on rangeland health.

In some allotments, it appears that grazing plans are making progress toward meeting the Wyoming Standards for Healthy Rangelands. In the Atlantic City allotment the permittees agreed to manage the riparian-wetland areas under an AMP. These areas are fenced into riparian-wetland pastures that are grazed during a short time period during the grazing season. Then these pastures are rested so that riparian-wetland vegetation can regrow and recover. The riparian-wetland conditions in these pastures has improved with increased water flow and holding capacity, along with new willow growth and stabilized banks occurring within the pasture.

Thirty-six allotments (752,507 acres) in the planning area are not meeting rangeland health standards. In most cases, failure to meet standards for riparian-wetland areas contributes to the failure to meet rangeland health standards (BLM 2009a).

Three allotments (31,771 acres) are not meeting rangeland health standards due to factors other than livestock that adversely impact the rangeland resource, such as improperly cut roads, causing soil erosion and runoff. In the last 20 years, approximately 40 miles of roads have been closed because they contributed to rangeland health degradation.

There are currently 203 allotments (1,315,667 acres, or approximately 55 percent of the planning area) in the planning area that have not been assessed. These allotments are being scheduled for rangeland health assessments.

Range Improvements

On average, the BLM has completed or reconstructed between 8 and 20 new range improvements per year totaling approximately \$40,000 to \$150,000 annually. The improvement projects are funded through grazing receipts authorized under Section 3 of the Taylor Grazing Act, and primarily consist of fences, reservoirs, springs, water wells, and vegetative treatments. Since 1986, the Lander Field Office has installed 53 stock reservoirs, 38 spring developments, 76 stock water wells, 110 miles of stock water pipeline, and 355 miles of pasture division fence (Table 3.56, "Type and Number of Rangeland Improvements Completed in the Planning Area, 1986-2009" (p. 485)). A full list and breakdown of all range improvements completed in the planning area between 1986 and 2009 is provided in Appendix K (p. 1547).

Table 3.56. Type and Number of Rangeland Improvements Completed in the Planning Area, 1986-2009

Project Type	Quantity
Reservoirs (number)	53
Springs (number)	38
Wells (number)	76
Pipelines (miles)	110
Fences (miles)	355
Land Treatments (number)	315
Vegetation Manipulations (acres)	10,550

Project Type	Quantity
Management Facilities (number) (cattleguards, corrals, etc.)	32
Source: BLM 2009a	

Rangeland improvement projects, grazing systems, and other BMPs have been used in rangeland management since the early 1970s. The BMPs have been further improved in recent years through educational workshops and seminars and through federal and private nonprofit cost-sharing programs. These management practices are used independently or cooperatively among livestock lessees, the University of Wyoming Extension Service, state and federal agencies, conservation districts, and interested members of the public. The goal is to allow sustainable livestock use to continue on public lands without damaging the vegetation resource and to maintain healthy watersheds and wildlife habitats.

Management Challenges for Livestock Grazing

Grazing of livestock on public lands receives a high level of public interest, differing opinions, scrutiny, and legal challenges. Many legal challenges have led to policy changes within the BLM since the mid 1970s. The health of the public lands is monitored by public organizations for a variety of reasons. Maintaining successful collaboration and communication with the public, ranchers, private land owners, and other stakeholders is a necessary, but sometimes difficult and lengthy process.

Another management challenge for livestock grazing is meeting the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)). There is an identified need to meet the Wyoming Standards for Healthy Rangelands and many allotments are currently not meeting these standards (as identified in Appendix K (p. 1547)). Appendix K (p. 1547) lists the allotments that have been assessed for meeting the Standards: 266,537 acres have been determined to meet the Standards; 673,075 acres have failed assessments with livestock grazing identified as the causal factor; 31,771 acres have failed assessments with the causal factor identified as other than livestock grazing; and 47,661 acres have failed the assessments with no identified causal factor. Coordinating resource programs and management actions that are related to the Wyoming Standards for Healthy Rangelands (soils, riparian-wetland areas, upland vegetation, rangeland management, water quality, and air quality) and developing management strategies to improve allotments not meeting rangeland health standards is a challenge. The BLM is also constrained in the ability to monitor and implement programs to improve rangeland conditions by limited funds and the availability of personnel.

Balancing livestock use and the need for additional range infrastructure to meet the Wyoming Standards for Healthy Rangelands while meeting or progressing toward other resource objectives is a challenge. This is particularly true when developing grazing strategies that emphasize the use of range improvement projects to meet the Wyoming Standards for Healthy Rangelands. Livestock grazing and the construction of range improvements (such as fences and water developments), can potentially impact other resources including special status species such as the grizzly bear, grey wolf, and greater sage-grouse. Recently, habitat fragmentation has caused concern regarding greater sage-grouse and livestock grazing throughout the West. Building wildlife compatible fences and doing so in a manner that prevents habitat fragmentation is a challenge.

The construction of range improvement projects, especially water developments (such as reservoirs), can increase the distribution of livestock and forage availability for livestock grazing

across the planning area. However, topography, steepness of slopes, distance from existing water sources, and management for other resource objectives can present management challenges in locating range improvements in areas that would benefit livestock grazing.

From 2000 to 2006, the planning area was in a sustained hydrological drought. Through negotiations and grazing permittee cooperation, range specialists in the Lander Field Office were able to temporarily reduce stocking levels or modify seasons of use on an allotment-by-allotment basis to decrease the impact of drought conditions on soil and vegetation resources. Although the planning area continues to reflect a long-term hydrologic drought, the amount and timing of precipitation through this period were enough for forage growth to support reduced levels of livestock grazing. Adjusting stocking rates to varying climate conditions, including drought, is a normal aspect of annual grazing management; however, extreme periods of drought and fluctuations in precipitation can increase the challenges associated with livestock industry grazing.

Changing weather patterns can affect livestock seasons of use. More precipitation, earlier and warmer spring weather, less frequent but more intense weather systems, and rising CO₂ levels influence vegetative types by favoring some invasive species over native species and possibly affecting seasonal growth patterns for vegetation, which affect livestock seasons of use.

Increases in the price of private rangeland based on nonranching valuation, high operating costs, and fluctuations in precipitation and vegetative condition have lead to uncertainties in livestock industry grazing. These conditions result in a reduction in the availability of water for irrigating hay on private land due to changing precipitation patterns and melting of glaciers in the Wind River Mountains, and the loss of confined feed lots for animal feeding operations (Pew 2008).

Other management challenges associated with the livestock grazing program include assessing the impact of invasive plant species on forage production and addressing long-term monitoring of allotments and management activities.

3.6.6. Recreation

Federal lands within the planning area provide a broad spectrum of outdoor opportunities that afford visitors the freedom of recreational choice with minimal regulatory constraints. Recreational opportunities are offered to the public on all BLM-administered lands within the planning area.

Planning Guidance

The planning guidance for Recreation has substantially changed since the 1987 RMP. The RMP planning process historically identifies areas where recreation is the management focus. These Special Recreation Management Areas (SRMAs) were traditionally areas that had higher recreation use or required extra recreation investment or where more intensive recreation management was needed, whereas Extensive Recreation Management Areas (ERMAs) were established in most cases to facilitate dispersed recreation. The 2011 revision of the Recreation and Visitor Services planning guidance provides a more specific definition of SRMAs and ERMAs. The difference between SRMAs and ERMAs is summarized in Table 3.57, “Extensive Recreation Management Area and Special Recreation Management Area Management and Objectives” (p. 488) below:

Table 3.57. Extensive Recreation Management Area and Special Recreation Management Area Management and Objectives

	SRMA	Distinct ERMA	The Remainder of the Planning Area
<i>Recreation Opportunity Management</i>	Managed to provide specific opportunities and settings in response to visitor demand.	Managed to provide diverse opportunities, as necessary to achieve planning objectives.	Managed to provide a diversity of recreation opportunities and settings.
<i>Allowable Uses and Management Actions</i>	Allowable uses and management actions must sustain or enhance recreation settings characteristics.	Allowable uses and management actions address recreation-tourism issues, activities, conflicts, and/or particular recreation setting.	Management Actions and allowable uses may be necessary to protect resources or investments.
<i>Management Common To All Areas</i>	All areas are managed to meet statutory requirements to ensure resource protection, human health and safety, reduce conflict as well as achieve other program planning objectives.		
ERMA Extensive Recreation Management Area SRMA Special Recreation Management Area			

Recreation Anticipated Demand

In 1978, Driver and Brown (Driver and Brown 1978) proposed a hierarchical framework that specifies four distinct levels of recreational demands: (1) for activities, (2) settings (situational attributes), (3) for specific psychological outcomes--experiences and satisfactions, and (4) for benefits. This is the framework of recreation demand that will be addressed through the various land use decisions of this planning process.

The following existing sources are incorporated into this affected environment by reference and will assist the BLM in making recreation decisions to address the levels of customer demand discussed above:

- Congressional designations and legislation associated with the NHTs and CDNST.
- The various comprehensive plans for the five Congressionally Designated Trails.
- Surveys conducted locally and nationally (such as those that have been conducted on the NHTs, at developed recreation sites, and by national entities such as the Roper and Starch).
- Scoping comments on this RMP process.
- Information from community Workshops such as those conducted in the Fall of 2007.
- Community planning documents such as the Dubois Gateway Community plan, community assessments by the Wyoming Business Council, and County and City plans.

Visitor Characterization

Based on field observations, discussions with customers, and the sources discussed above, public land visitors are traveling to the planning area from the following primary sources: national and international location, the Casper population center, and locally.

Visitors from outside of Wyoming come to the region from National and international locations. One reason for this widespread visitation is that the area is on a popular route towards two national parks. Additionally, the town of Lander is home to the International Climber's Festival, a privately funded festival where visitors travel to celebrate the sport of climbing. NOLS is headquartered in Lander and conducts educational/recreational courses on BLM-administered lands. Many of these students return for additional visits and courses. These are cases where non-agency marketing techniques have increased visitation to the public lands.

Field observations have found that there has been a notable increase in visitation from the adjacent states of Utah, Colorado, Idaho, and Montana. The use demographic change is due to the fact that visitors can escape the developed and sometimes crowded recreation settings of their home states while also enjoying some of the unique setting attributes (NHTs or the Sinks Canyon climbing area) available within the planning area. This trend has been witnessed throughout the planning area, but seems to be strongest along Congressionally Designated Trails and around newly discovered climbing areas. The visitation increase around climbing areas is correlated to the increase in the activity's popularity over the last 20 years. Potential exists to increase this visitor use demographic across several areas of the planning area especially in areas with existing infrastructure and/or in areas where resource conflicts are minimal.

Visitors originating from the Casper population center recreate in all areas of the planning area, however, this user faction typically focuses around the Rattlesnake Hills and Green Mountain areas. This regional-scale demand is generated as a result of the planning area's large acreage of public lands and the accessibility of those lands. In contrast, public lands around these visitors' home area are isolated, often inaccessible tracks of public land encompassing small acreage (USFS 2004a).

Wyoming's population has grown in the past 10 years (Sonoran Institute 2007) and an increasing number of people are living near public lands for a diversity of recreational opportunities characterized by the "mountain resort or outdoor lifestyle." The region is truly a year-round place to live and work; as a result, BLM-administered lands are absorbing increasing recreational demand and use. The towns of Lander, Hudson, Riverton, and Dubois all have public lands bordering them that are used as "backyard" recreation areas by local residents. Outside of the use season (June-August) of the Congressionally Designated Trails and fall big-game hunting seasons (September-November), when visitation is high everywhere, the greatest number of visitors to public land is on a daily basis near communities.

Activity Demand

Nationally, participation in outdoor recreation activities has increased. Table 3.58, "Outdoor Recreation Survey" (p. 489) is adapted from Moore and Driver (Moore and Driver 2005) and summarizes the results from the 2000 Roper Starch Worldwide Inc. Survey (Roper Starch 2000) and the 1994-2001 Cordell, Betz, Green, and Mou National Survey on Recreation and the Environment (NSRE) (Cordell et al. 2004). The table shows the percent of adults participating in predominant planning area outdoor recreation activities and percent change from 1994 to 2001.

Table 3.58. Outdoor Recreation Survey

Activity	Percent participating 2000 (Roper Starch)	Percent participating 2000-2001 (NSRE)	Percent Change 1994-2001 (NSRE)
Kayaking	5	3.46	185.66
Viewing or Photographing Fish	-	24.77	96.79

Activity	Percent participating 2000 (Roper Starch)	Percent participating 2000-2001 (NSRE)	Percent Change 1994-2001 (NSRE)
Snowmobiling	2	5.55	70.22
Viewing Wildlife	16	44.68	55.80
Backpacking	9	10.68	53.78
Day Hiking	19	33.25	51.80
Canoeing	5	9.73	50.65
Bicycling	24	39.49	50.00
Horseback Riding	5	9.68	47.99
Mountain Climbing	-	6.03	46.52
Running or Jogging	18	34.53	43.54
Coldwater fishing	-	13.58	42.77
Developed Camping	26	26.38	38.71
Driving off road	7	17.46	36.50
Walking for pleasure	57	82.97	35.32
Visiting archeological sites	-	20.91	30.71
Bird watching	16	32.38	30.61
Big game hunting	-	8.41	28.92
Cross-country Skiing	2	3.82	27.59
Rock Climbing	4	4.32	26.86
Primitive Camping	8	16.01	24.75
Small Game Hunting	-	7.23	21.43
Picnicking	36	54.49	20.91
Migratory bird hunting	-	2.36	20.05
Visiting historic sites	-	46.20	13.91
Sightseeing	4	8.15	-0.63
Orienteering	-	2.00	-9.36
Source: BLM 2009a; Moore and Driver 2005; Roper Starch 2000; Cordell et al. 2004			
NSRE National Survey on Recreation and the Environment			

Outcome Demand

BLM will base planning objectives in SRMAs and to a lesser extent in ERMAs around customer demand for Outcomes. Recreational Outcomes are defined as follows: (1) realization of a satisfying recreation experience, (2) An improved change in condition, and (3) maintenance of a desired condition, prevention of an undesired condition, or reduction of an undesired condition (Hopkins 2008). In general the Roper Starch Survey Outdoor Recreation in America 2000: Addressing Key Societal Concerns (2000) documented some benefits that are important or being realized by national and local customers (Roper Starch 2000). The following statements are directly from the “Study Highlights”:

- *Americans continue to ascribe many benefits to participation in recreation. This new research confirms motivations of fun, fitness, and family togetherness, but also shows Americans believe outdoor recreation plays a role in addressing various key social concerns, especially those related to young people. For instance, close to 8 in 10 Americans (79%) believe outdoor recreation can improve education.*
- *Americans also see outdoor recreation playing a role in reducing childhood obesity—a full three quarters of Americans see it as having a role in helping with this problem.*
- *According to most Americans, participating in outdoor recreation also can significantly aid parent—child communication, with three quarters crediting it as playing a role.*

- *Even in the case of tough social problems such as juvenile crime (71%), underage drinking (66%), and illegal drug use (64%), outdoor recreation is viewed by a strong majority as playing positive role.*
- *Overwhelmingly Americans believe that if people participated more in outdoor physical activities, the health effects would be beneficial (93%). Outdoor recreation is seen as the best way to be physically active (90%).*
- *Virtually all Americans agree that outdoor recreation is a good way to increase people's appreciation for nature and the environment (95%). Similarly, more than 9 in 10 agree that if people spent more time outdoors, they would better understand the importance of environmental protections.*

Throughout the RMP revision process BLM will work to further understand customer demand, this continuing input process will allow BLM to develop recreation based objectives and decisions that address customer demand and issues. Furthermore, recreation based decisions will be outcome based which allows BLM to monitor and adjust as social and resource conditions change through the life of the plan.

Existing Recreation Management and Supply

Recreation Management Areas

The 1987 RMP for the Lander Field Office identified three SRMAs. These areas included both congressionally and administratively recognized areas. The areas include: South Pass Historic Mining area, the NHT, and the CDNST.

South Pass Historic Mining Area: The South Pass Historic Mining Area is a SRMA, with emphasis on recreational opportunities in rustic, open-space settings.

National Historic Trail: The existing plan establishes a SRMA for the NHTs (which in 1987 included only the Oregon/Mormon Pioneer Trail; subsequent action expanded the NHTs to include the California and Pony Express Trails. Together, these four trails are referred to as the NHTs). The management prescriptions for the NHTs are very general, with particular focus on preventing over utilization of the NHT and the contributing historic sites, whether by trekkers or hunters. Subsequent actions have refined the kind of BLM monitoring and prescriptions that are required to protect the historic resources. Detailed SRMA plans have not been adopted.

Continental Divide National Scenic Trail: The existing plan recognizes the CDNST as a SRMA but does not provide detailed management prescriptions.

The 2005 revision of the BLM land use planning handbook also clarified that any area not delineated as a SRMA is an ERMA. In consideration of this update the Lander Field Office manages twelve ERMAs: the Lander Field Office wide ERMA created as a result of the above update, and 11 distinct ERMAs to address local recreation issues including Castle Gardens, Whiskey Mountain/East Fork, Green Mountain, Lander Slope/Red Canyon, Dubois Badlands, Sweetwater Canyon, Sweetwater Rocks, Lysite Badlands, Copper Mountain, Beaver Rim, and Government Draw. The planning method of identifying separate ERMAs allows BLM to recognize areas that required more active management in order to meet our standard ERMA objectives focused on resource protection, human health and safety, and alleviating resource use/user conflicts. Identification of separate ERMAs will be used in this planning process in several circumstances including: to recognize areas that require more active management than the

rest of the planning area, to address local planning issues, to recognize an area where customer demand may warrant an SRMA allocation but the various alternatives to management preclude SRMA management, and/or in areas where the potential exists for future consideration of the area for SRMA allocation during a planning amendment process.

General recreation management in the 1987 RMP was not outcome based, causing planning decisions to focus on direct actions rather than minimum actions to produce outcomes. In doing so recreation sections of RMPs provided little to no guidance for the future and were mostly dictated by other program decisions (wildlife) and the existing management situation. The erroneous focus on direct actions also created a situation where SRMAs lacked sufficient allowable use decisions and detail to maintain the areas' recreational values. Finally, recreation management actions were splayed across the planning area usually to address concerns associated with overuse, while the SRMA and ERMA allocations had no bearing or influence on the action. The new land use planning guidance for recreation directs BLM to utilize an outcome based planning system, in turn addressing the shortcomings discussed above.

Developed Site Management

The 1987 RMP directed that management and maintenance will be provided at seven existing developed recreational sites (in both ERMAs and SRMAs), including Atlantic City, Big Atlantic Gulch, and Cottonwood campgrounds; Split Rock and Devil's Gate interpretive sites; and Wild Horse Point overlook and Castle Gardens picnic areas (see Map 120). Since then, the BLM has added several developed sites including: Beaver Creek Nordic ski area, Steamboat Lake interpretive site, and the Martins Cove interpretive trail. The need exists to consider how these various developed sights supply the existing recreation environment and how they can be linked in a more comprehensive fashion.

Recreation Management Actions

Recreation management actions were addressed in each of the management units in the existing plan. All of the units emphasize resolution of competing uses and provide resource protection. All are managed for dispersed recreation. The following list summarizes the management unit specific management actions (other than the SRMAs above):

Green Mountain: The unit is managed as an ERMA with the following specific prescriptions:

- 14-day camping limits
- Safety hazards eliminated
- Aesthetic values improved
- Quotas established for commercial hunting camps

Beaver Creek: The unit is managed as an ERMA with the following specific prescriptions:

- The Split Rock interpretive site is maintained and incorporated in the management plan for the NHT with provisions for use by visitors, resource protection, and interpretative needs.

Lander Slope: The unit is managed as an ERMA with no major recreational developments.

- 14-day camping limits to avoid "homestead" camping and be in conformance with management of the adjoining USFS lands

- Quotas on commercial hunting camps

Red Canyon: The unit is managed to protect wildlife values and geology, particularly as reflected by the NNL. To protect elk winter range, the unit is closed to all winter sport activities.

- 14-day camping limit to eliminate “homestead” camping

Gas Hills: Generally, the unit is managed as an ERMA. However, two intensive managed areas are identified:

- Devil’s Gate interpretive site is managed to meet interpretive and visitors’ needs coupled with resource protection.
- Castle Gardens management focuses on interpretation and resource protection while allowing for dispersed recreation management.

East Fork: Minimal recreation management is provided. The emphasis is on reducing user conflicts and providing resource protection.

Whiskey Mountain: is managed in cooperation with the WGFD on non-consumptive wildlife visitor use management.

- 14-day camping limit
- Commercial hunting camps not permitted if they are not compatible with bighorn sheep management

Dubois Badlands: This unit is an ERMA that is managed in its “natural state” with a focus on emphasizing resolving competing uses and providing resource protection.

General Lander Field Office Area: The unit is managed as an ERMA with dispersed recreation where visitors will have the freedom of recreational choice with minimal regulation.

Recreation Setting and Foreseeable Development

The recreation setting is an integral supply component of the recreation environment because settings “not only affect the experiences and benefits”, but also help to “define what type of activities might occur in an area” (Pierskalla et al. 2004). The setting concept recognizes that visitor attainment of desired recreational experience and benefit outcome opportunities is linked to the physical, social, and operational recreation setting. The range of possible combinations of activities, settings, and experience opportunities can be represented in terms of a spectrum or continuum. This continuum of recreation setting characteristics has historically been referred to as the Recreation Opportunity Spectrum (ROS). The information provided by the ROS is both a descriptive and a land use allocation tool for recreation planning, management, and research (Clark and Stankey 1979). The existing plan used the ROS as a tool to characterize or describe the existing environment. The new RMP will also use recreation settings (in SRMAs) as reasonable foreseeable development scenarios and desired future condition for the recreation resource. In most SRMAs, reaching and maintaining a desired setting condition requires allowable use decisions (such as NSO restrictions) and management actions (Hopkins 2008).

The current BLM-specific methodology for describing the recreation setting builds on the historic ROS concept and has been termed the recreation setting. The BLM now describes the recreational setting across three main factors: the character of the natural landscape (Physical Setting); the

character of recreation and tourism use (Social Setting); and how public land agencies, other land managers and private sector service providers manage public use (Operational Setting). These variables combine as descriptors of the recreation environment that can then be placed across a spectrum of six overall recreation settings. The six overall recreation settings moving from least developed to most developed are: Primitive, Back Country, Middle Country, Front Country (or Transition), Rural, and Urban. The BLM typically does not manage for urban settings. This methodology for describing the recreation setting builds on the historic ROS concept and is here by referred to as recreation settings.

The existing 1985 ROS map (Map 86) utilized a mapping technique in which all three setting attributes were combined to form one recreation setting map. This technique resulted in a map that was weighted heavily toward the physical setting and less towards addressing the recreational expectation of visitors. This technique yielded accurate setting capacity descriptions; however, it does not lend itself to setting allocations or prescriptions. Moreover, it is a top-down management approach that fails to be responsive to the different populations utilizing the public lands. The new recreation setting inventory for the Physical, Social, and Operational settings is depicted on Maps 87–89. Trends in recreation setting can be garnered by comparing the new physical setting map with the existing ROS map. Recreational management recognizes four key issues when forecasting the setting changes over time:

- Population growth
- Changing public expectations and demand for outdoor recreation opportunities
- Increased energy development/exploration
- Increased occurrences of large ranches being subdivided to accommodate non-agricultural uses

Overall Physical, Social, and Operations settings are demonstrating an urbanizing trend, which is likely to continue. At the broadest level, the physical, social, and operational recreation character of BLM public lands is quickly changing from less natural to more developed, from less crowded to more contacts with others, from less restrictive to more rules and regulations. These changes will impact the activity opportunities that can be offered and the recreation experience and benefit opportunities that can be produced by land managers and partners.

Existing Use Levels and Forecasts

Visitor Use Figures

By 2000, 78 percent of Americans participated at least monthly in outdoor recreation activities, up 50 percent from 1994 (Cordell 1999). Most public land use estimates and activity participation estimates depend entirely on field observations and professional judgment of the recreation staff and hence are not scientifically based. Recreation use figures are tracked in the Recreation Management Information System and are available at the Lander Field Office. In addition, several other entities such as the WGFD, County Governments, and the Wyoming State Trails program collect use figure information. These sources also indicate an overall increase in outdoor recreation participation across the planning area.

While visitor use figures are critical to an input/output (or IO model) economic analysis, these figures are not an indicator of recreational quality.

One example of this phenomenon is in areas enjoyed for solitude or naturalness, in these areas increases in visitor use can degrade the quality of recreation environment.

Another problem with visitor use figures as a recreation indicator lie in the simple fact that these figures do not provide any indication of customer demand, instead they simply reflect where people are going based on current management.

Finally, a limitation of input/output economic analysis and visitor use figures lies in the simple fact that the IO model is only concerned with use figures of nonresidents. The BLM recreation program is often geared to supply local customer demand whereas an IO model and the visitor use data supporting it does not recognize economic benefits accrued as a result of recreation enhancements to support local community residents. A non-market analysis technique (such as Contingent Valuation Method) is far superior to capturing the true economic contribution of recreation management. Based on time and data constraints this plan will use an IO model to calculate the economic benefits of recreation, therefore visitor use data in support of this analysis will only be compiled for nonresident visitors.

Special Recreation Permits

The amount and type of Special Recreation Permits (SRP) are indicators of the current level of use and in some case reflect the activity demand of the public. There are four types of uses for which SRPs are required: commercial use, competitive events, organized groups, and recreation use in special areas. Most SRPs are related to hunting outfitting; however the Lander Field Office does have a very diverse SRP program.

There has been increased demand for SRPs over the past 20 years. Currently BLM administers 30 SRPs as multi-year permits. In addition, the office typically authorizes another 10 one-time events and organized groups.

No limits on the number or type of SRP exists however, authorized activities along the NHTs are managed closely in order to maintain the areas cultural resources. Conflicts have arisen when SRPs are issued for activities that are out of character with the existing recreation setting such as large group use in an area with Back Country characteristics, and conflict with other resource values, such as in an area containing threatened and endangered species.

Since SRPs are a manner by which the agency delivers recreational outcomes to visitors it is important that the BLM issue SRPs to complement existing land use plan objectives. The RMP will establish broad objectives across the entire planning area that will provide a guide to administer the SRP program in a way that ensures a healthy outfitter and guide service sector, while also ensuring permitted activities extend the agency's ability to deliver targeted outcomes to visitors.

Recreation Use Forecasts

It is anticipated that recreational use will increase in the next 20 years. The factors influencing this trend include: a projected moderately heavy population pressure, a projected moderately heavy recreation demand pressure, and the planning area's total land area in public land ownership in comparison to eastern Wyoming (Moore and Driver 2005). The increase in recreational use will necessitate an outcome based approach to recreation management. Such an approach provides land managers enough flexibility to adapt with the dynamic nature of the use, while also ensuring the use is guided by planning instead of the agency constantly reacting to the use. In addition, an

outcome based approach will allow the agency to encourage increased use in areas where such increases will be environmentally sustainable and minimize conflict among users.

Management Challenges for Recreation

Simultaneously managing lands in the planning area for recreational use and other forms of development is the greatest recreation management challenge. Modifications to the environment as a result of energy and minerals development have the potential to alter recreational settings and shift the types of recreation experiences possible. In the case of SRMAs, reaching and maintaining a desired setting condition could require management actions to establish allowable uses and development requirements (e.g., NSO restrictions) (Hopkins 2008).

The WGFD has a walk-in hunt program with private land owners, often BLM livestock grazing permittees, to allow hunters to enter privately owned lands to hunt. The WGFD sees the walk-in hunt program as important for Wyoming hunting; see <http://wgfd.wyo.gov/plpwhmprogram/fmWalkinHuntingHome.aspx>. There are six walk-in hunt program areas partially or fully in the planning area - five in Fremont County and one in Natrona County. One BLM permittee commented on the Draft RMP and EIS that their ranch's ability to continue with the program depends on maintaining their current levels of AUMs. Otherwise, they would need to add more fences to their private property to support more intensive grazing. This would result in the loss and fragmentation of habitat and perhaps make their ranch no longer of value to the walk-in hunt program (Graham No Date).

3.7. Special Designations

This section describes ACECs, Congressionally Designated Trails (NHTs and National Scenic Trails [NSTs]), Wild and Scenic Rivers (WSRs), and WSAs. Other special designations that are not currently designated or proposed for designation in this Proposed RMP and Final EIS, such as National Recreation Trails or National Water Trails, are not discussed further in this document. Special designations are areas that have either been administratively or Congressionally designated where specific management is required to meet resource goals and objectives. These areas often include important biological (or other natural system), historic, cultural, scenic, or other resource values.

3.7.1. Congressionally Designated Trails

BLM land use planning guidance requires special management for Congressional designations (BLM Land Use Planning Handbook H-1601-1). Congressionally Designated Trails in the planning area include the CDNST and the Oregon, Mormon Pioneer, California, and Pony Express NHTs.

Additionally, management of Congressionally Designated Trails is guided by IM 2009-215 (Planning for Special Designations within the National System of Public Lands). Under IM 2009-215:

A presidential proclamation or act of Congress that designates an area within the National System of Public Land supersedes conflicting direction by the FLPMA. Specifically the land use plan and management direction for such a designation must comply with the purposes and objectives of the proclamation or act of Congress regardless of any conflicts with the FLPMA's multiple use mission...

When integrating planning for a special designation created by presidential proclamation or act of Congress with a general RMP planning process, the Field Office should ensure that the RMP identifies the objects or resources for which the area was designated and illustrates how those objects or resources are protected by the plan. The RMP must also clearly distinguish between the planning area for the RMP and the planning area for the special designation. The existence of multiple decision areas necessitates a plan distinction between the decision and analysis for each area. Additionally, an integrated planning process should conclude with an independent Record of Decision for both the RMP planning area and the special designation planning area.

In 1968, the National Trails System Act (NTSA) (Public Law 90-543) provided for the development of a national system of trails in urban, rural, and wilderness settings. Originally, the NTSA specified three categories of national trails: NSTs, recreation trails, and connecting or side trails. In 1978, historic trails were added as another category. Today, only Congress can designate NHTs and NSTs.

The NTSA designated five trails (the Continental Divide Trail and the Oregon, Mormon Pioneer, California, and Pony Express Historic Trails) as national trails. The NTSA, other supporting legislation, and BLM policies direct the BLM to conserve and protect these national trails and the nature and purposes for which each trail was established. The sections that follow identify the nature and purposes of each of the Congressionally Designated Trails.

3.7.1.1. National Scenic Trails

The NTSA provides for the designation of NSTs “so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass” (Section 3(a)(2)). After passage of the NTSA, the Bureau of Outdoor Recreation (in accordance with the NTSA) performed a study that endorsed designation of the Continental Divide Trail as an NST.

Continental Divide National Scenic Trail

The NTSA (Public Law 90-543) provides for the designation of NSTs “so located as to provide for maximum outdoor recreation potential and for the conservation and enjoyment of the nationally significant scenic, historic, natural, or cultural qualities of the areas through which such trails may pass” (Section 3(a)(2)).

The CDNST is a 3,100-mile trail extending from Canada to Mexico and passing through the Rocky Mountain States of Montana, Idaho, Wyoming, Colorado, and New Mexico. An 89-mile on-the-ground route of the CDNST was designated through the planning area in 1999, followed by an additional 3 miles of route in 2001. These 92 miles of the CDNST include 2 miles of hiking trail, 10 miles of cross-country travel, 4 miles of gravel roads, and 76 miles of primitive two-track roads (Map 121). A cooperative agreement with the Wyoming State Lands & Investment office provides for joint management of approximately 3 miles of scattered state lands in the 92 miles of route.

After the passage of the NTSA, the Bureau of Outdoor Recreation (in accordance with the Act) conducted a study that endorsed designation of the Continental Divide Trail as a NST (Bureau of Outdoor Recreation 1976). The overall vision for the CDNST, as stated in the 1976 Study Report follows:

The primary purpose of this trail is to provide a continuous, appealing trail route, designed for the hiker and horseman, but compatible with other land uses...To provide hiking and horseback access to those lands where man's impact on the environment has not been adverse to a substantial degree and where the environment remains relatively unaltered. Therefore, the protection of the land resource must remain a paramount consideration in establishing and managing the trail. There must be sufficient environmental controls to assure that the values for which the trail is established are not jeopardized....The basic goal of the trail is to provide the hiker and rider an entrée to the diverse country along the Continental Divide in a manner which will assure a high quality recreation experience while maintaining a constant respect for the natural environment.

Similarly, the 2009 Comprehensive Plan for the CDNST (USFS 2009b), described the nature and purposes of the CDNST:

The nature and purposes of the CDNST are to provide for high-quality scenic, primitive hiking and horseback riding opportunities and to conserve natural, historic, and cultural resources along the CDNST corridor.

In recognition of the above, the 2009 Comprehensive Plan emphasized the importance of visual management as a key factor to ensure user enjoyment of the CDNST. The plan directed the BLM to consider the trail a high sensitivity travel route. Importantly, the trail corridor across the planning area encompasses diverse landscapes. A portion of the trail landscape encompasses areas of "high absorption capacity," meaning activities along these could be easily located out of view. Conversely, another portion of the trail crosses a landscape that does not readily absorb contrasting activities, that is observers traveling along this section of trail would be particularly sensitive to activities that altered the characteristic landscape.

The portion of the CDNST in the planning areas travels through numerous differing landscapes. The trail enters south of Green Mountain and travels northwest towards Crooks Gap. In the Crooks Gap area the trail travels through a more industrialized zone with many resource uses including major pipeline ROWs, reclaimed uranium mining, major motorized travel routes, and an oil field on top of Crooks Mountain. Continuing in a northwesterly direction, the trail travels into a zone with very little development or resource use. This zone contains some of the most wide-open and undeveloped landscapes available on the entire CDNST. After crossing the Bison Basin Road, the trail connects to the NHTs and travels across an area known as the Antelope Hills. Within the Antelope Hills landscape are numerous granite outcrops and features that draw the observer's attention. The trail eventually crosses the Sweetwater River at the Phelps Dodge Bridge; here the trail travels toward South Pass City State Historic Park and the South Pass Mining ACEC. This section contains numerous cross-country sections and eventually drops the user into South Pass City. Continuing on from the Willow Creek trailhead, the trail heads cross-country for some time before returning to a primitive two-track and eventually encountering Wyoming Highway 28.

The diversity of landscapes and features encountered on each section of the trail has corresponding different visual resource classes. The existing plan visual resource designation for the trail is Class II-IV. These were established several years before the trail was designated; as a result, most of the visual resource classes do not consider the trail corridor. The most recent VRI was conducted in partnership with the University of Wyoming and considered the trail designation; as a result, inventory classes displayed a higher visual value than those considered in 1987. The new inventory found that the trail travels through VRI Classes II-IV, with a very high amount in Class III or higher.

Visitor use by through-hikers is on a slight upward trend. Use in both 2003 and 2004 was in the range of 40 to 60 through-hikers from May through September (BLM 2009e). Non-through-hiker day-use and multiple-day use of the trail is low. Other recreational uses on the designated route include hiking, hunting, mountain biking, and driving for pleasure, but are not considered uses tied directly to the trail.

A trailhead was developed in the parking area of the South Pass City State Historic Site in 2002. The trail uses the main site roadway before entering public land to follow the Volksmarch Trail for approximately 2 miles. It then follows a series of two-track roads and cross-country travel toward the Sweetwater River and beyond.

Further analysis of the recreation and visual trends of the trail are contained in the *Visual Resources* and *Recreation* sections. Currently, no allowable use decisions exist on or adjacent to the CDNST; this situation creates conflicting mandates for managers and members of the public. A change in management is needed in order to provide a diversity of trail landscapes that meet the demands of the NTSA, the Comprehensive Report, and the 2009 Comprehensive Plan. This National Conservation System landscape is not currently protected under standard mitigation guidelines or other planning decisions. Prescriptions to maintain this Congressionally designated resource need to address the following: activities under the 1872 Mining Law, management of ROWs, oil and gas development, management of OHVs, historical resource protection, as well as the management of recreational use and enjoyment of the trail.

Management Challenges for the Continental Divide National Scenic Trail

At present, there are no allowable use decisions on or adjacent to the CDNST. This creates one of the major management challenges for the CDNST: how to manage for multiple use while maintaining the CDNST's scenic value. For example, as the technology for wind-energy development changes, the increased height of wind turbines increases the potential for a visual impact to the CDNST.

To provide a diversity of trail landscapes that meet the demands of the NTSA, the Comprehensive Report and the 2009 Comprehensive Plan require a change in management. This National Conservation System landscape is currently unprotected under standard mitigation guidelines or other planning decisions. Prescriptions to maintain this Congressionally designated resource would need to address the following: activities under the 1872 General Mining Law, ROW management, oil and gas development, management of motorized vehicles, and historical resource protection, along with management of recreational use and enjoyment of the trail.

Refer to the *Visual Resources* section of this chapter for additional information on management challenges for the CDNST related to visual resources.

3.7.1.2. National Historic Trails

The Oregon, Mormon Pioneer, California, and Pony Express NHTs are four nationally significant historic trails that traverse the southern portion of the planning area. These trails mark the mid-1800s period of mass migration for pioneering Americans who headed West (Map 123). The Congressional designation of these trails as NHTs reflects their nationally recognized status as symbols of one of the most important and influential movements of people in United States history.

The four routes converge onto one general route and are managed as a unit through much of Wyoming. The NPS and the BLM have long described the Oregon, Mormon Pioneer,

California, and Pony Express Trails and its variants in central and western Wyoming as some of the best remains of these NHTs left in the United States. These trails include long stretches of well-preserved ruts, swales, and mostly intact historical settings. In fact, the entire section of the four NHTs within the planning area was designated as a High Potential Segment, which deserves the highest level of protection and preservation. The following sections describe the four NHTs and the Seminole Cutoff, including the nature and purposes of each NHT.

The management emphasis for NHTs gives priority to the high-potential sites and segments of the NHTs. These are considered to be “federal-protection components” (Sec. 3.16 U.S.C. 1242[a3]). High-potential sites and segments are defined in the NTSA as follows:

Sec.12(1): “The term “high potential historic sites” means those historic sites related to the route, or sites in close proximity thereto, which provide opportunity to interpret the historic significance of the trail during the period of its major use. Criteria for consideration as high potential sites include historic significance, presence of visible historic remnants, scenic quality, and relative freedom from intrusion.”

Sec. 12(2): “The term “high potential route segments” means those segments of a trail which would afford high quality recreation experience in a portion of the route having greater than average scenic values or affording an opportunity to vicariously share the experience of the original users of a historic route.”

The Oregon National Historic Trail

The Oregon NHT is a portion of the transcontinental route that was a migration route for prehistoric and early historic groups, and later became the main highway for European-American emigrants looking for new land and a new beginning in the largely unsettled western territories. This westward movement occurred primarily from the 1840s through the 1860s, but the Oregon Trail remained in use as a wagon trail as late as 1912. Estimates claim the number of pioneers who used the trail range from 350,000 to 500,000. Most of the emigrants traveled with wagon trains, spending an average of 6 months walking and riding over the arduous route. At least 20,000 died along the various emigrant trails during this period.

A large number of Oregon Trail emigrants settled the widely available lands in Oregon and Washington or set up commercial pursuits to serve the settlements. Later, discoveries of precious minerals became an impetus for migrations to different parts of the West and provided the basis for settlement of lands previously bypassed by the emigrants.

In the 1850s and 1860s, military and commercial interests used the Oregon Trail extensively. The supply needs of settlements, travelers, and Native American tribes under treaty enabled freighting companies to operate, while military garrisons were assigned to posts along the trail to protect the emigrants and freighters. Communications services also developed along the Oregon Trail, the most famous was the Pony Express. Stage lines also operated on the Oregon Trail, but some were forced to move to the more southern Overland Trail because of Indian attacks.

The use of the Oregon Trail and its contribution to settlement and development in the west are an important part of American history. Congress recognized this in 1978 by designating the Oregon Trail an NHT. Under this status, the federally administered portions of the Oregon NHT are protected from unwarranted impacts and are maintained for public enjoyment and use. The entire section of the Oregon Trail within the planning area is designated as a High Potential Segment, which deserves the highest level of protection and preservation.

The nature and purposes of the Oregon NHT through the planning area are:

- To identify, preserve, and interpret the sites, routes, and history of the Oregon Trail for all people to experience and understand.
- To commemorate the westward movement of emigrants to the Oregon country as an important chapter of our national heritage.

The Mormon Pioneer National Historic Trail

In the midst of the migration to Oregon and California, there was a smaller migration headed toward Utah. Most of these emigrants were Mormons (members of the Church of Jesus Christ of Latter-Day Saints), which was founded in 1830. The Mormon emigrants' goal was to get to the Great Salt Lake Valley where the new center of the Mormon Church had been established.

In 1846/1847, an advance party led by church leader Brigham Young headed west from Illinois and chose their new home in the Great Salt Lake Valley. The route these first pioneer Mormons used is the Mormon Pioneer NHT. In the two decades following their pioneering trek, thousands of Mormons from the eastern United States and Europe traveled to Utah to live in the Great Salt Lake Valley.

The route the Mormons used to get as far as mid-Nebraska differed from the Oregon Trail, but when the two trails met on the Platte River they basically followed the same route from there to Fort Bridger in southwest Wyoming. The Mormon Pioneer Trail complements the Oregon Trail as a major symbol of the nation's expansion. Whereas the Oregon Trail contributed to development in the far western states, the Mormon Pioneer Trail was one of the major factors in the initial development of the interior West. Congress observed the importance of the Mormon Pioneer Trail by designating it as an NHT in 1978. As with the Oregon Trail, the Mormon Pioneer Trail is now afforded protection from unwarranted disturbances and is maintained for public enjoyment and use. The entire section of Mormon Pioneer Trail within the planning area is designated as a High Potential Segment, which deserves the highest level of protection and preservation.

The nature and purposes of the Mormon Pioneer NHT through the planning area are:

- To identify, preserve, and explain the sites, routes, and history of the Mormon Pioneer Trail for all people to experience and understand.
- To commemorate the 19th Century migration of Mormon emigrants to the Valley of the Great Salt Lake as an important aspect of our national heritage.

The California National Historic Trail

Following the Oregon Trail to Fort Bridger, and then continuing west through Utah and Nevada, a small number of emigrants blazed trails into California as early as 1841. In 1846, the number of people headed to California is estimated to have been about 1,500. In 1848, gold was discovered in the Sierra Nevada Mountains of California, and by 1849, those moving to California exceeded those headed for Oregon. In 1850 alone, an estimated 44,000 emigrants arrived in California, and as many as 250,000 people traveled the California Trail from 1841 through 1868.

Some segments of the California Trail followed slightly different routes in Wyoming than the Oregon or Mormon Pioneer Trails. These cut-offs and short cuts were generally blazed to enable hurried travelers to bypass the slow wagon trains prevalent on the other trails.

The California Trail complements the Oregon Trail as a symbol of our nation's expansion. Emigration along the California Trail established a 2,400-mile transportation, commerce and communications route and helped secure the West for the United States. Therefore the trail's social, political, and economic contributions to the fledgling United States are highly significant. Congress observed the importance of the California Trail by designating it an NHT in 1999. As with the Oregon and Mormon Pioneer Trails, the California Trail is now afforded protection from unwarranted disturbances and is maintained for public enjoyment and use. The entire section of the California Trail within the planning area is designated as a High Potential Segment, which deserves the highest level of protection and preservation.

The nature and purposes of the California NHT through the planning area are:

- To enable all people to envision and experience, in a coherent and convenient way, the heritage and impacts of the western overland migration.
- To encourage preservation of its history and physical remains.

The Pony Express National Historic Trail

By 1860, the population and commerce of the West had grown, civil war loomed, and fast, reliable communications between East and West became critical. The freighting firm of Russell, Majors & Waddell, hoping for a profitable federal postal contract, devised a relay system of riders, stations, and stock handlers to move light mail quickly between St. Joseph, Missouri, and San Francisco. This system, popularly known as the Pony Express, launched on April 3, 1860.

Although the Pony Express was efficient and popular, it was not profitable due to high overhead costs, and the enterprise never secured a government contract. It was also not competitive with transcontinental telegraph route, which was substantially completed in 1861. The Pony Express was forced to discontinue service in November 1861, after operating for only a year and a half.

Nevertheless, the Pony Express is significant in American history because it proved the viability of an all-season, central overland route for fast communications between East and West; played a vital role in aligning California with the Union; and ensured timely transcontinental communications during the first year of the Civil War before completion of the transcontinental telegraph (NPS 1999).

The Pony Express Trail follows the Oregon Trail through the planning area. Although driven out of business by the transcontinental telegraph after a year and a half, it remains part of national history as an important American achievement. Congress observed the importance of the Pony Express Trail by designating it an NHT in 1999. As with the other NHTs, the Pony Express NHT is now afforded protection from unwarranted disturbances and is maintained for public enjoyment and use. The entire section of the Pony Express Trail within the planning area is designated as a High Potential Segment, which deserves the highest level of protection and preservation.

The nature and purposes of the Pony Express NHT through the planning area are:

- To identify, preserve, and explain the sites, routes, and history of the Pony Express for all people to experience and understand.
- To commemorate the rapid mail delivery that linked eastern and western states.

The Seminoe Cutoff of the Oregon, Mormon Pioneer, California, and Pony Express Trail

The Seminoe Cutoff of the Oregon, Mormon Pioneer, California, and Pony Express Trail begins in the southeastern portion of the planning area where it cuts off from the main Oregon, Mormon Pioneer, California, and Pony Express Trail. Probably named for Basil LaJeunesse, a trapper known as Seminoe, this route remains south of the Sweetwater River and was used by freighters and travelers seeking a speedier trip. Although it avoids a number of river crossings, it was also relatively dry and longer than the main Oregon, Mormon Pioneer, California, and Pony Express Trail. The Seminoe Cutoff leaves the main Oregon, Mormon Pioneer, California, and Pony Express Trail at Warm Springs and rejoins the main trail west of the Ninth Crossing and a few miles east of South Pass (Wyoming SHPO 2009). As part of the California Trail, the Seminoe Cutoff is afforded protection from unwarranted disturbances and is maintained for public enjoyment and use. The entire section of the Seminoe Cutoff within the planning area is designated as a High Potential Segment, which deserves the highest level of protection and preservation.

Location and Geography of the NHTs

The four NHTs share a mostly common corridor from Horse Creek, east of Independence Rock, to Burnt Ranch, south of Atlantic City. Some individual sites identified on Map 123 are depicted because they are associated with mineral withdrawals. It is a route considered to be one of the most pristine segments of these trails in the entire nation. The overall good-to-excellent condition of the trail corridor is due to a lack of effects on the trails themselves, and to the mostly intact historic setting around the trails. For this reason, the BLM and the NPS have designated this stretch of NHTs as a High Potential Route Segment, a designation that carries the highest priority for protection and management in the National Trails System. Map 123 shows the locations of the NHTs in Wyoming.

Physical Condition and Use

After heavy use of the NHTs' near the mid- to late- 19th Century, most of the trail corridor reverted to minimal use by ranchers, recreationists, hunters, and other casual users. However, commemorative anniversary wagon trains in the 1990s increased the popularity of the NHTs, and use began to increase. By 2000, use in the western part of the planning area (especially by Mormon groups) had increased dramatically, and the trails there began to be adversely affected. By 2005, the BLM developed better management strategies to protect the historical values of the NHTs. At present, most of the Oregon, Mormon Pioneer, California, and Pony Express Trails are still in good-to-excellent condition, and the affected parts are likely starting to recover. See Map 122 for High Potential NHT segments in the planning area.

The NHTs and particularly the Mormon Pioneer Trail are visited by tens of thousands each year, often youth groups reenacting the emigrant experience. To many of the visitors, the NHTs are Traditional Cultural Properties which provide opportunities for spiritual and religious experiences. The Church of Jesus Christ of Latter-Day Saints wrote in comments on the Draft RMP and EIS, that the BLM should "include language that recognizes and documents the full significance to LDS Church members of using the Trails to reenact the handcart pioneers' role in 19th Century history...The treks provide LDS Church members opportunity for deeply moving and important religious experiences, giving context to significant Church history and beliefs in an unmatched setting. The treks reconnect Church members and others who participate with them to the historic fabric of the 19th Century westward migrations, allowing participants to better understand the

hardships, emotions, and courage of all pioneers of that time through a deeply personal experience on the very trails the pioneers used” (Genho 2012).

Special Sites Associated with the NHTs

Associated with the NHTs are a number of sites on BLM-administered surface that figured prominently in the combined history of the NHTs. These sites sometimes occur outside of the current NHT corridor, but are included in this section because they are integral parts of the NHT system. The sites are shown on Map 123, and include Martin’s Cove, Devil’s Gate, Split Rock, Ice Slough, Rocky Ridge, Rock Creek Hollow, and Gilesie Place, all described below.

Martin’s Cove

Martin’s Cove is a historic site associated with the Mormon Pioneer NHT in the southeastern part of the planning area (603 acres of BLM-administered surface) (Map 123). The Cove is a sheltered recess among the Sweetwater Rocks where Mormon emigrants took refuge from a winter storm in 1856. The cove is next to the bare granitic hills of the Sweetwater Rocks, just north of the Sweetwater River, about 2 miles west of Devil’s Gate and 1 mile north of the Oregon/Mormon Pioneer Trail.

The setting of this disaster involved Captain Edward Martin’s 6th Handcart Company, a large group of Mormon converts who were headed to the Salt Lake Valley of Utah. The company originated in England, and they planned to walk across the interior of the United States pulling two-wheeled handcarts. A winter storm caught them weak and unprepared, and the emigrants took refuge in Martin’s Cove. The company was eventually rescued and brought to Salt Lake City, but not before 145 people in the company died from exposure and starvation.

Until recently, the site was only casually used by local ranchers and occasional history buffs. However, in the 1990s, the Mormon Church purchased the ranch that controlled access into the Cove. Visitation immediately increased, and the BLM and the Church jointly developed a walking path, interpretive stations, and other facilities to handle the surge of visitors. Although these modern facilities diminished the historical integrity of the Cove, they have kept the effects from an estimated 40,000 visitors per year to an acceptable level.

Devil’s Gate

Devil’s Gate (395 acres of BLM-administered surface) is a historic site associated with the NHTs just east of Martin’s Cove (Map 123). Devil’s Gate is a unique geological feature where the Sweetwater River has cut through the Sweetwater Rocks leaving a narrow cleft measuring approximately 370 feet deep, 2,500 feet long, and less than 50 feet wide in places. This site is 5 miles southwest of Independence Rock near the point where the NHTs begin to parallel the Sweetwater River. Many pioneer diaries include remarks about Devil’s Gate, and some of the emigrants wrote or carved their names on the cliffs around this landmark. Devil’s Gate appears mostly as it did in the mid-1800s, except for an irrigation canal built along the river cut, and some modern ranching developments near it. For more than a century, use of Devil’s Gate was minimal. The site is accessible from the Martin’s Cove complex, and there has been increased use in recent years without much of an effect on the site.

Split Rock

Split Rock is a geologic feature with historical associations to all four of the NHTs. The Split Rock area includes an interpretive site (242 acres of BLM-administered surface) and the Split

Rock/Twin Peaks NRHP site (645 acres of BLM-administered surface). Approximately 15 miles west of Martin's Cove and Devil's Gate, Split Rock is a prominent and highly visible landmark and served as a geographical guide for Native Americans, fur traders, and emigrants. This high cleft in the granite of the Sweetwater Rocks could be seen soon after the emigrants left Devil's Gate, and the area near Split Rock was a favorite camping spot. During the 1860s, the Pony Express, Overland Stage Line, and the Eleventh Ohio Cavalry maintained a post in the local area. Although there has been some agricultural development near the Sweetwater River, the general area is little changed from its 19th Century historical setting.

Ice Slough

Ice Slough is another historic site associated with the four NHTs (1,345 acres of BLM-administered surface) (Map 123). Ice Slough is a wide, shallow, swampy drainage that was often mentioned by the emigrant travelers on the Oregon, Mormon Pioneer, and California Trail. This spring-fed boggy area, approximately 23 miles west of the Split Rock landmark, is paralleled by the trail for several miles before the trail crosses it. The emigrants used the slough for grass, water, camping, and reportedly as a source of summertime ice. The ice, found under peat and water layers, could be obtained even in the hot summer months, and this oddity was a constant and welcome surprise to the pioneers. Along the banks of the slough was a Pony Express station, which operated in the 1860s. U.S. Highway 287 crosses the slough, and ditches have been cut into it in places, but otherwise the site still appears mostly as it did in the 19th century. Heavy grazing in Ice Slough was recently controlled by the installation of an electric fence, which was designed to be minimally visible from the NHT.

Rocky Ridge

Rocky Ridge is a historic site associated with all four of the NHTs, and is in the southwestern part of the planning area (833 acres of BLM-administered surface) (Map 123). Rocky Ridge was a landmark of a different sort for the emigrants. This area, approximately 19 miles west of Ice Slough, was a spot where the emigrants were forced to leave the lowlands along the Sweetwater River and cross a high, barren and rocky ridgeline north of the river. Many of the pioneers' diaries speak of the rough, jarring ride they endured and the difficulty of the steep climb over the ridge. The area today still exhibits rust stains on the rocks from the iron-tire wheels of the early wagons. The Rocky Ridge area is isolated and retains much of its historical and natural character.

After the 1870s, Rocky Ridge reverted to minimal use by ranchers, hunters, and trail enthusiasts. However, in the 1990s, commemorative anniversary wagon trains increased the popularity of the NHT and Rocky Ridge, and use began to increase. By 2000, use of Rocky Ridge (especially by Mormon groups) had increased dramatically, and the site began to be adversely affected. By 2005, vehicle use over Rocky Ridge had been prohibited, and non-vehicular use was beginning to be better managed to protect the historical character of Rocky Ridge. At present, use is being carefully monitored, and the site might be starting to heal. Part of Rocky Ridge is within the current NHT ACEC and part is not.

Rock Creek Hollow

Rock Creek Hollow is a historic site associated with the Mormon Pioneer NHT (94 acres of BLM-administered surface) (Map 123). This site (formerly known as Willie's Handcart Rescue Site) was one of the locations where the Willie's Handcart Company took shelter after being rescued in the fall/winter of 1856. The hollow, located approximately 6 miles west of Gillespie

Place, lies in the narrow floodplain of Rock Creek near the spot where the Oregon Trail crosses the creek.

Rock Creek Hollow commemorates the disaster to Willie's Handcart Company in October and November of 1856. The same storm that trapped Martin's Handcart Company also overtook Willie's Handcart Company. The Willie's Company, was overtaken by the storm and took shelter in several different areas, including Rock Creek. More than 70 people from this company died during the disaster, including several people at Rock Creek. The Mormon Church has developed the private land at this site, but the BLM portion to the south is mostly untouched and appears much as it did in the 1850s. Under the existing plan, mining activities within one-eighth of a mile of Rock Creek Hollow are required to have a Plan of Operations, and part of the site is within the NHT ACEC.

Gilespie Place

Gilespie Place is a historic site associated with the four NHTs and later mining and settlement history of the area (240 acres of BLM-administered surface) (Map 123). This site is along the Oregon/Mormon/California Trail, just east of the historical mining camp of Lewiston. Gilespie Place consists of two standing structures, several foundations with wall remains, and a flowing spring. The site, located along a major transportation route, was associated with several historical events of Wyoming's early territorial and state history.

The earliest historical use of the site probably occurred during the Oregon/Mormon Pioneer Trail era, when early emigrants passed through the region in the 1840s. Although there are no known emigrant-diary accounts of this site, the site's spring (Radium Spring) was probably often used as a convenient water source. In addition, there was probably some overnight emigrant camping at the site.

Radium Spring probably continued to be used by travelers over the entire emigrant trail era. In the 1880s, mineral exploration began in earnest in the Lewiston Mining District, which included the Radium Spring area. Although no records are available, there was probably some small-scale exploration in the local area.

Structures were built on the site after the turn of the 20th Century, but there is no record of exactly when sites were constructed. Artifactual evidence points to pre-1920s dates of occupation for at least some of the structures. This evidence corresponds to newspaper accounts of a Mrs. S. F. Gilespie having settled on 160 acres in the immediate area sometime around 1910 (BLM 2009a). Touted as "Wyoming's Copper Queen," Mrs. Gilespie seems to have been heavily involved in mining ventures in the local area around Lewiston. During this period, the spring was claimed to have radium in its waters and was advertised to have healthful properties.

Several structures in fair-to-good condition still exist at the site. Under the existing plan, mining activities within one-eighth of a mile of Gilespie Place are required to have a Plan of Operations.

Current Management of the NHTs

Guidelines, Management Plans, and Other Current Management Specific to NHTs

Specific to the Oregon, Mormon Pioneer, California, and Pony Express Trails, the BLM Wyoming Oregon/Mormon Pioneer National Historic Trails Management Plan (BLM 1986) states:

Because of the Trails' status as congressionally designated components of the National Trails System, management decisions have been made that significant segments of the Oregon and Mormon Pioneer Trails are to be protected. It is incumbent on BLM managers to maintain the scenic/historic integrity of historic sites and cross-country segments on the public, to avoid destruction of trail resources, to mitigate unavoidable impacts, to accord the trails a priority status in the land use planning process, and generally extend to the trails the type of protection afforded to other nationally significant historic sites. (Oregon/Mormon Pioneer National Historic Trails Management Plan: Part I, Bureau of Land Management Responsibilities, Section 3).

All historic sites and cross-country segments of the trails on federal lands should be managed to protect and interpret their historic values. (Oregon/Mormon Pioneer National Historic Trails Management Plan: Part II, General Management Objectives, Section 3).

New fencing projects will cross the trail corridor at right angles to minimize the number of feet per miles of fence within the corridor. Gates, and in some cases, cattleguards will be installed in the fence at trail crossings. Fragile or pristine trail ruts will be avoided with fence crossings. (Oregon/Mormon Pioneer National Historic Trails Management Plan: Part III, Oregon/Mormon Trail General Management Policy, Fencing section).

The existing plan focuses on general methods of management that protect and maintain important trail values while allowing public use and enjoyment of the NHTs. Important segments of the trails and trail-related sites are recommended for special protection, interpretation, use, or other management measures. The management decisions outlined in the Oregon/Mormon Pioneer Trails Management Plan are consistent with the decisions in the RMP (BLM 1987b).

The NHTs are managed for cultural and recreational values. The NPS and the BLM have designated the portions of the NHTs in the planning area as a High Potential Route Segment. Under current management, a corridor one-quarter mile on each side of the NHTs has an NSO restriction for leasable minerals, locatable mineral exploration (occasional withdrawals and plans of operations requirements), utility systems (avoided), wind development and other ROWs (avoided), and motorized travel use (limited and closed at Rocky Ridge).

National Historic Trails ACEC

The current NHTs ACEC consists of approximately 27,728 acres of BLM-administered surface along the Oregon, Mormon Pioneer, California, and Pony Express NHTs, all of which follow essentially the same east-west route through southwestern Natrona County and southern Fremont County (Map 130). This trails corridor follows the Sweetwater River for most of its length. Resources that met the ACEC importance and relevance criteria in the 1987 RMP included cultural and scenic values. Those resources continue to meet the criteria for this RMP revision. The ACEC includes several other significant historical sites (e.g., Independence Rock, Devil's Gate, Martin's Cove, Split Rock, Ice Slough, Sixth Crossing, Rocky Ridge, and Burnt Ranch) that are associated with the NHTs. One-quarter mile on either side of the trails is designated as VRM Classes I or II.

Proposed Expansion

The proposed expansion of the NHTs ACEC is on either side of the existing ACEC and would expand the ACEC to 468,183 acres of BLM-administered surface. As with the existing ACEC, the proposed expansion area contains scenic values and historic resources. This expansion is proposed to address visual sensitivity within 5 miles of the trail (or the foreground/middleground zone). Public interest and visual sensitivity in the viewshed along these trails in the area encompassed by this proposed expansion has increased since publication of the existing plan. Management challenges for the existing ACEC also apply to the expansion.

Refer to Chapter 2 of this document for detailed management prescriptions for the NHTs (Special Designations – Congressionally Designated Trails).

National Register of Historic Places and National Historic Landmark

Specific sites along the NHTs require special management. One site along the NHTs is part of a National Historic Landmark (NHL) (Devil's Gate), two sites are listed on the NRHP (Martin's Cove and Split Rock), and four are eligible for listing on the NRHP (Ice Slough, Rocky Ridge, Rock Creek Hollow and Gillespie Place).

Devil's Gate

Devils Gate is part of the Tom Sun NHL and is managed for cultural and recreational values. The NPS and the BLM have designated this site as a High Potential Historic Site. The site has an NSO restriction for leasable minerals; is withdrawn from locatable mineral entry; avoided for utility systems, wind development, and other ROWs; and open to limited motorized travel. Devil's Gate is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Devil's Gate is stable; surprisingly, heavy use at nearby Martin's Cove has not caused an increase in impacts to Devil's Gate.

Martin's Cove

Martins Cove is listed on the NRHP and is managed for cultural and recreational values. The NPS and the BLM have designated this site as a High Potential Historic Site. The BLM and the Mormon Church jointly manage Martin's Cove. The site has an NSO restriction for leasable minerals; is withdrawn from locatable minerals; avoided for utility systems, wind development, and other ROWs; is fenced from grazing; and is open to limited motorized travel. Martin's Cove is not part of an ACEC, but is within the area nominated to become part of an expanded NHT ACEC.

The condition trend for Martin's Cove was down, but has now stabilized. Martin's Cove is one of several sites associated with the NHTs where heavy use has caused measurable damage. Intensive management has stopped the downward trend, with improvement of previous damage occurring.

Split Rock

Split Rock is listed on the NRHP and is managed for cultural and recreational values. The NPS has designated this site as a High Potential Historic Site. The site has an NSO restriction for leasable mineral; is withdrawn from locatable minerals; avoided for utility systems, wind development, and other ROWs; and is closed or open to limited motorized travel. Split Rock is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Split Rock is stable because it is not easy to access and does not receive heavy use.

Ice Slough

Ice Slough is eligible for listing on the NRHP and is managed for cultural, recreational, and grazing values. The NPS and the BLM have designated this site as a High Potential Historic Site. The site has an NSO restriction for leasable minerals; requires a Plan of Operations for locatable mineral entry; is avoided for utility systems, wind development, and other ROWs; and closed or open to limited motorized travel. Ice Slough is only partly within the current NHT ACEC, but is within the proposed NHT expansion ACEC. The condition trend for Ice Slough was down, but has now stabilized. A riparian-wetland fence was built several years ago to relieve grazing pressure on the Slough, and this has markedly improved the site's condition.

Rocky Ridge

Rocky Ridge is eligible for listing on the NRHP and is managed for cultural and recreational values. The NPS and the BLM have designated this site as a High Potential Historic Site. The site has an NSO restriction for leasable minerals; is withdrawn from locatable mineral exploration; avoided for utility systems, wind development, and other ROWs; and is open to limited motorized travel. Rocky Ridge is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Rocky Ridge was down, but has now stabilized. Rocky Ridge is one of several sites associated with the NHTs where heavy use has caused measurable damage. Intensive management has stopped the downward trend, with some healing of earlier damage being observed.

Rock Creek Hollow

Rock Creek Hollow is eligible for listing on the NRHP and is managed for cultural and recreational values. The site has an NSO restriction for oil and gas leasing; is withdrawn for locatable mineral exploration; avoided for utility systems, wind development, and other ROWs; and is open to limited motorized travel. Rock Creek Hollow is only partly within the current NHT ACEC, but is within the area nominated to become part of an expanded NHT ACEC.

The condition trend for Rock Creek Hollow is down, mostly due to over-development. Rock Creek Hollow is one of several sites associated with the NHT where excessive development and use has caused measurable damage. However, the BLM-administered portion of the site remains in stable to only slightly down condition due to restrictions on its use.

Gilespie Place

This site is eligible for listing on the NRHP and is managed for cultural and recreational values. The site has an NSO restriction for oil and gas development; is withdrawn for locatable mineral exploration; avoided for utility systems, wind development, and other ROWs; and is open to limited motorized travel and grazing use. Gilespie Place is only partly within the current ACEC, but is within the area nominated to become part of an expanded NHT ACEC. The condition trend for Gilespie Place was down; however, stabilization of the standing structures at the site has stopped the downward trend.

Oregon Trail Withdrawals

There are several existing Oregon Trail withdrawals along the NHTs that were approved in the 1970s when the Oregon Trail was established as a NHT. These mineral withdrawal areas were chosen because they included emigrant inscriptions and campsites, or were the locations of NHT related historical events. They comprise three separate parcels that cover 315 acres of BLM-administered surface. They were carried forward in the existing plan and are still

applicable. These withdrawals are managed for cultural and recreational values. The sites have an NSO restriction for oil and gas development; are avoided for utility systems, wind development, and other ROWs; and are open to limited motorized travel. The Oregon Trail withdrawals are only partly within the current NHT ACEC, but are within the area nominated to become part of an expanded NHT ACEC.

The condition of the NHTs in the withdrawal areas varies from stable to deteriorating, depending on the location. The portion of the NHTs between 6th Crossing (of the Sweetwater River) and Rock Creek Hollow has experienced heavy use and measurable damage. More intensive management on the part of the BLM has slowed the downward trend, with some healing of earlier damage being observed.

Management Challenges for National Historic Trails

As with other nonrenewable resources, balancing the BLM's commitment to multiple-use with the preservation needs of NHTs presents a management challenge. Pressures on NHTs would likely increase from continued development. Indirect and cumulative effects degrade the trails' historic and natural landscape.

Issues related to preservation of the viewshed are particularly complicated due to wind-energy development, potential location of transmission lines, and other development. The setting is an essential component in determining whether a particular trail segment contributes to the trail's overall significance and in maintaining the historic setting that is critical to providing a quality experience for visitors. The *Visual Resources* section of this chapter provides additional information regarding visual resources along NHTs.

The demand for consumptive use of NHT resources through tourism is relatively high in the planning area and is anticipated to increase over time, reflecting an increasing interest in history and heritage tourism. However, due to the growing interest in the trails, impacts to NHT resources would have to be managed to avoid adverse effects to them. Visitor use of the NHTs is an indicator of public interest in and regard for these traces of the westward emigration, a highly significant trend in our nation's history. Lower visitation might therefore benefit the physical resources, but would imply that the public does not place much value in them. Therefore, visitation should not be discouraged, but managed so as to minimize physical impacts while encouraging visitor use and appreciation of the resource.

In addition to programmed uses in the planning context, collecting, looting, and vandalism of NHT historic sites are forecast to continue to be a problem in the planning area. Some of these unlawful activities are attributable to new types of motorized and nonmotorized vehicles, which have increased the utilization of more remote parts of the NHTs. This factor has also increased the potential for degradation in remote NHT segments and sites due to human-caused activities and impacts. This type of impact is difficult to quantify, but certain types of sites, especially historic station locations and structures, would continue to suffer damage from these kinds of activities.

3.7.2. Wilderness Study Areas

The Wilderness Act of 1964 established a national system of lands designed to preserve a representative sample of ecosystems in a natural condition for the benefit of future generations. With the passage of FLPMA in 1976, Congress directed the BLM to inventory, study, and recommend which public lands under its administration should be designated as wilderness.

Areas identified under this direction are WSAs. To be designated as wilderness, an area must have the following characteristics:

- *Size*: roadless areas of at least 5,000 acres of public lands or of a manageable size
- *Naturalness*: generally appears to have been affected primarily by the forces of nature
- *Opportunities*: provides outstanding opportunities for solitude or primitive and unconfined types of recreation

There are no Congressionally designated wilderness areas in the planning area; however, there are eight WSAs (see Table 3.59, “Current WSA Acreage in the Planning Area and BLM-Recommended Acreage for Wilderness Areas” (p. 511) and Map 128). The BLM’s authority to establish new WSAs expired on October 21, 1993 (BLM 2003). With the increase in demand for consumptive and non-consumptive resources, and with increased housing and subdivision development near natural and primitive areas, the WSAs preserve unique ecosystem niches that can support desired outcomes.

The BLM is required by Congress to manage WSAs to preserve the wilderness characteristics under the non-impairment standard until Congress designates the lands under wilderness review as wilderness, or releases the lands to uses other than wilderness (BLM Manual 6330, *Management of Wilderness Study Areas*). The BLM performs inventories of these areas and makes recommendations regarding the areas and acreage that it recommends for designation as wilderness. These recommendations are based on factors such as the manageability of the area, how well it meets the characteristic of wilderness, conflicts or potential for conflicts with other users and uses, and other relevant factors. Table 3.59, “Current WSA Acreage in the Planning Area and BLM-Recommended Acreage for Wilderness Areas” (p. 511) shows the current acreage for WSAs in the planning area and the BLM’s recommendations for the number of acres that should be designated as wilderness.

Table 3.59. Current WSA Acreage in the Planning Area and BLM-Recommended Acreage for Wilderness Areas

Area Managed as Wilderness	Wilderness Study Areas (BLM-administered surface acres)	Recommended for Wilderness (BLM-administered surface acres)
Whiskey Mountain	519	0
Dubois Badlands	4,561	0
Sweetwater Canyon	9,135	5,538
Larkin Dome	6,347	0
Split Rock	13,964	0
Savage Peak	7,178	0
Miller Springs	6,697	0
Copper Mountain	6,936	0
Total	55,337	5,538
Source: BLM 1991		
BLM Bureau of Land Management WSA Wilderness Study Area		

An important distinction between WSAs and Wilderness areas lies in the fact that WSAs are areas that have been found to possess wilderness characteristics. The Wyoming BLM made recommendations to Congress (1991) in regards to which areas met the criteria to be managed as Wilderness. To date, no WSAs managed by the BLM in Wyoming have been designated or

released from the wilderness system by Congress. For a WSA to become Wilderness, Congress must so designate those lands; until Congress acts on these areas BLM is obligated to manage these lands so as not to impair Congress's ability to designate the area as Wilderness. All WSAs are managed in accordance with BLM Manual 6330, *Management of Wilderness Study Areas*, which replaces the Interim Management Policy for Lands Under Wilderness Review (H-8550-1).

Whiskey Mountain WSA (WY-030-110)

The Whiskey Mountain WSA includes 519 acres of BLM-administered surface approximately 5 miles south of Dubois bordering the USFS Fitzpatrick Wilderness Area (Map 128). The Whiskey Mountain WSA is bounded by the Ross Lake trail on the east, the Fitzpatrick Wilderness Area on the south and west, and private lands to the north. The WSA is on the northern slope of Whiskey Mountain in the Wind River Mountains. In 1931, a fire burned a large portion of the Wind River Mountains, including the WSA, and the area is currently not distinguishable from the surrounding areas. The terrain is rough and mountainous, and the dominant vegetation is limber pine and Douglas-fir, interspersed with burnt snags. The area possesses scenic qualities and provides opportunities for solitude and primitive recreation. The area is used for a variety of recreational activities. Primary factors that attract visitors are the areas' topography, scenic vistas, and wildlife resources.

Dubois Badlands WSA (WY-030-109)

The Dubois Badlands WSA contains 4,561 acres of BLM-administered surface just north of the Wind River and 2 miles east of the town of Dubois (Map 128). The WSA is approximately 4 miles long and between 1 and 2 miles wide. The area can be seen by motorists on U.S. Highway 287 south of Dubois. The WSA's topography consists of badlands and flat-topped hills that are extensively eroded and separated by drainage patterns. The red and tan sedimentary rock bandings in the WSA are particularly noticeable when the vegetation along the Wind River is a contrasting green. The total relief above the Wind River is approximately 400 feet, with notable topographic features, including eroded pinnacles and spires.

Sweetwater Canyon WSA (WY-030-101)

The Sweetwater Canyon WSA contains 9,135 acres of BLM-administered surface in Fremont County, approximately 15 miles east of South Pass City (Map 128). The boundary of the WSA is defined by roads and state and private lands, but does not include private or state in-holdings.

The two basic types of topography in the WSA are the Sweetwater Canyon and its tributary draws and the rolling hills that surround the canyon. Sweetwater Canyon is a water-carved gorge almost 500 feet deep and between 6 and 7 miles long. The walls are almost vertical in places along the canyon. There are bare rock outcrops throughout the canyon interspersed with a variety of vegetation, including sagebrush, grasses, other shrubs, and pockets of aspen and willow. The topography and vegetative features of the canyon contrast strongly with the surrounding hills.

In addition to topography, the river that runs through Sweetwater Canyon offers high-quality brown and rainbow trout fishing. The WGFD has classified this waterway a trout water of regional importance. Recreational visitors from Wyoming and nearby states fish and float the waterway.

The primary management challenge for the WSA is conflict with livestock grazing, which is currently allowed in the Sweetwater Canyon WSA, and recreational uses of the area. The BLM fenced the canyon in the mid-1990s and local grazing permittees agreed to suspend grazing for

five years following this action. This management change has resulted in an overall trend of improved range condition and improved recreation experiences. However, since the reinstitution of grazing, the BLM has received input from recreationists indicating that their wilderness experience was affected by livestock grazing. Visitors have reported encountering livestock in or near dispersed camps, in riparian-wetland areas, and in meadows, and manure in camp sites, livestock tracks in riparian-wetland areas, and odors (BLM 2009a). Research supports the position that livestock grazing can detract from wilderness experiences (Johnson et al. 1997) and indicates that certain groups of recreationists, such as fishermen, are more sensitive to the presence of livestock (Sanderson et al. 1986).

Lankin Dome WSA (WY-030-120)

The Lankin Dome WSA contains 6,347 acres of BLM-administered surface in the eastern portion of the planning area (Map 128). Elevations in the area range from approximately 6,200 feet at the western boundary road to 7,700 feet on Lankin Dome. The primary topographic features of the WSA are uplifted mountains of reddish granite rocks, slabs, and exfoliating domes, and the flats of Noel Pocket. Vegetation cover varies between the two different topographic forms. The mountainous rocky topography supports little vegetation except along drainages where pockets of limber pine, juniper, aspen, and sagebrush can be found. These green vegetation pockets contrast with the reddish granite rocks and add visual interest.

The primary management challenge for the Lankin Dome WSA is recreational access. The BLM has received comments on the recreational value of the Sweetwater Rocks and Granite Mountains within the WSA, and on the need for better access throughout the Granite Mountains area. Any action to improve public access in the areas surrounding the WSAs would need to be developed to ensure any increase in visitation did not conflict with BLM Manual 6330, *Management of Wilderness Study Areas* and travel management designations for the WSA. Inadvertent trespass by public lands users is also an issue of concern in this area due to adjacent private land.

Split Rock WSA (WY-030-122)

The Split Rock WSA contains 13,964 acres of BLM-administered surface (Map 128). The WSA is part of the Granite Mountain Uplift, a large east-west uplift that separates the greater Green River Basin from the Wind River Basin. The area is composed of reddish eroding granite divided by numerous small drainages or pockets. Many of the granite uplifts form large slabs, domes, piles of broken rocks, and slope exceeding 100 percent in places. Elevations range from approximately 6,200 feet in Beaton Pocket to above 8,500 feet on McIntosh Peak. The total relief in the WSA is approximately 1,800 feet.

In addition to scenic resources created by the areas' topography, the WSA contains cultural and recreation resources. Historic features in the area include Miller Cabin, archeological sites containing arrowhead and thumb scraper chippings, and a buffalo jump used by prehistoric hunters. Within the drainage, small wooded patches allow visitors to experience solitude near the access points to the WSA. The contrast between the green vegetation in these drainages and the red granite rocks adds visual interest.

Savage Peak WSA (WY-030-123a)

The Savage Peak WSA contains 7,178 acres of BLM-administered surface near Savage Peak (Map 128). Most of the WSA consists of rugged and mountainous terrain with large vertical relief. Large expanses of bare granite are not found elsewhere in central Wyoming, and these

rocks form a scenic backdrop for the Sweetwater River Valley. Bare rock predominates and vegetation is generally sparse, except in small stands of Douglas-fir, limber pine, aspen, and cottonwood along drainages. Outside of the drainages, scattered juniper trees are the primary vegetation in rocky areas. Steeply rising slopes surround large areas of open grass and sagebrush on the western portion of the WSA.

Miller Springs WSA (WY-030-123b)

The Miller Springs WSA contains 6,697 acres of BLM-administered surface (Map 128). The WSA is part of the Sweetwater Rocks complex, and is characterized almost entirely by rough, broken granite domes and outcrops. Parts of the unit resemble piles of monolithic rock. Vegetation in the area is composed of juniper and scattered limber pine along the rocky slopes, and aspen along the base of the rocks. The remaining area is composed of sagebrush flats, which make up between 10 and 15 percent of the WSA.

Copper Mountain WSA (WY-030-111)

The Copper Mountain WSA contains 6,936 acres of BLM-administered surface in Fremont County approximately 10 miles north of Shoshoni and east of the Boysen Dam at the upper end of the Wind River Canyon (Map 128). Steep canyons and rocky slopes dominate the area. Rugged mountains in the WSA rise from between 5,000 feet and 6,400 feet. Total relief in the unit is 1,400 feet. Scenic vistas from the WSA include the Wind River Basin and Boysen Reservoir south and west of the WSA, and the Wind River Mountains and Beaver Rim.

Management Challenges for Wilderness Study Areas

Overall management of WSAs is in compliance with BLM Manual 6330, *Management of Wilderness Study Areas*, and the Lander Field Office has no documented violations on file. BLM WSA management guidance under BLM Manual 6330, *Management of Wilderness Study Areas* and previously under the Interim Management Policy for Lands Under Wilderness Review (H-8550-1) has been adequate to protect the wilderness characteristics in the WSAs. Continuing challenges to WSA management include motorized vehicle management and the enhancement of wilderness experience for visitors to these areas. Motorized vehicle management limitations apply to all WSAs and are directed by BLM Manual 6330, *Management of Wilderness Study Areas* and the BLM Land Use Planning Handbook (H-1610-1). The Land Use Planning Handbook states that travel management designation for WSAs must be at least limited to roads and trails in existence at the time of WSA designation, with open areas only appropriate for sand dunes and over-the-snow travel. Refer to the *Comprehensive Trails and Travel Management* section of this document for additional information on travel management designations.

The BLM separately manages lands found to contain wilderness characteristics that were identified after the BLM's authority to establish WSAs expired. The discussion of these areas is found in the *Lands with Wilderness Characteristics* section of this chapter.

3.7.3. Wild and Scenic Rivers

The National Wild and Scenic River System (NWSRS) is a system of nationally designated rivers preserved in a free-flowing condition; their immediate environments are recognized for outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural, and other similar values. The system consists of three types of rivers:

1. *Recreation* – rivers or sections of rivers that are readily accessible by road or railroad, that might have some development along their shorelines, and that might have undergone some impoundments or diversion in the past.
2. *Scenic* – rivers or sections of rivers free of impoundments with shorelines or watersheds still largely undeveloped, but accessible in places by roads.
3. *Wild* – rivers or sections of rivers free of impoundments and generally inaccessible, except by trails, with essentially primitive watersheds or shorelines, and unpolluted waters.

The BLM is responsible for evaluating all rivers on BLM-administered land to determine if they are appropriate for addition to the NWSRS. The BLM also makes, as appropriate, recommendations for legislative actions to accomplish such additions. Congress ultimately decides whether to include a waterway segment in the NWSRS.

In accordance with the Wild and Scenic Rivers Manual (8351), the BLM evaluates identified river segments for their eligibility and suitability for WSR river designation through its RMP process. BLM shall afford protective management to all eligible river segments as necessary to ensure that the existing qualities upon which their eligibility is based are not degraded. All eligible river segments are tentatively classified and management measures instituted as necessary to ensure appropriate protection of the values supporting the eligibility and classification determination. Actual classification is a Congressional legislative determination; BLM's classification is a planning determination and is only tentative prior to congressional action. Each eligible river segment is further evaluated in the RMP process to assess whether or not it would be suitable for inclusion in the NWSRS. The planning determination of suitability provides the basis for any decision to recommend legislation. The Wild and Scenic River review (BLM 2002a) will be reviewed and revisited through this Land Use Planning process. At the conclusion of this land use planning process the BLM (through public involvement) will make final: tentative classification for eligible waterways, develop interim management prescriptions for these waterways, and conclude with determinations of suitability.

At present, there are no Congressionally designated WSRs in the planning area; however, nine waterways have been found to meet the eligibility criteria for WSR designation, and two of these waterways have been preliminary determined to meet suitability factors. The Lander Field Office Review of Potential Wild and Scenic Rivers in the Lander Planning Area (BLM 2002a) documents these findings. The BLM is seeking public comment on the Wild and Scenic River Report (BLM 2002a). Comments received during this RMP Revision will be incorporated into the Final Wild and Scenic River Report. Recommendations to Congress for inclusion of BLM-administered land and waterways in the NWSRS will consider public comments.

Step I – Eligibility Criteria

The Lander Field Office reviewed a total of 157 waterways in the planning area for eligibility as part of its 2002 WSR review (BLM 2002a). The Lander Field Office Review of Potential Wild and Scenic Rivers in the Lander RMP Planning Area contains detailed descriptions of the waterway identification and review processes. To begin these reviews, the BLM identified natural waterways (including both perennial and non-perennial rivers and streams) in the planning area based on a broad definition of free-flowing that included all waterways on BLM-administered land. Following this initial inventory, the BLM Interdisciplinary Team members reviewed the waterways to determine if they met eligibility criteria of containing at least one of the outstandingly remarkable values described in BLM Manual 8351. These outstandingly

remarkable values include scenic, recreational, geologic, fish, wildlife, cultural, historic, and other similar values (e.g., ecologic/biologic diversity, paleontologic, or botanic values). Of the 157 waterways reviewed, 148 were found not to possess outstandingly remarkable values. These 148 waterways were subsequently dismissed from further consideration.

Nine waterways were determined to meet the WSR eligibility criteria. Two of these nine waterway review segments include a main waterway segment and one or more tributaries that have been grouped together for review as “waterway units.” The BLM gave all eligible waterway segments a tentative classification of either wild, scenic, or recreational. The BLM determined tentative classifications based on the degree of development along the waterway and on adjacent lands at the time of the evaluation. Table 3.60, “Characteristics for Wild and Scenic River-Eligible Waterways in the Planning Area” (p. 516) lists these nine waterways and waterway units, their total lengths, their outstandingly remarkable values, and their tentative classifications (segments found suitable for listing are identified on Map 129).

On review of the original inventory in preparation for the RMP revision, the Lander Field Office initially identified a few reaches of the Upper Willow Creek area in the Sweetwater drainage as potentially having been not reviewed. Subsequent evaluation determined that these reaches had been properly reviewed.

Table 3.60. Characteristics for Wild and Scenic River-Eligible Waterways in the Planning Area

Waterway Reviewed	Segment and Length (miles)	Free Flowing	Outstandingly Remarkable Values on Public Lands	Tentative Classification
Baldwin Creek (includes Upper Baldwin Creek and Lower Baldwin Creek)	8.1	Yes	Scenic, Recreational, Wildlife	Wild/Scenic
Ice Slough	1.6	Yes	Historical	Wild
Little Popo Agie River	1.5	Yes	Scenic, Recreational, Cultural	Wild
North Popo Agie River	0.7	Yes	Scenic, Recreational, Cultural	Wild
Rock Creek	4.0	Yes	Historical	Scenic
Sweetwater River (includes Granite, Mormon, Strawberry, and Willow Creeks)	12.9	Yes	Scenic, Recreational, Historical, Other - Ecological	Wild
Warm Springs Creek	1.3	Yes	Geological, Historical	Recreational/Scenic
Willow Creek	1.3	Yes	Recreational, Historical	Scenic
Wind River	0.5	Yes	Scenic, Geological	Scenic
Source: BLM 2002a				

Step II – Suitability Factors

All waterway segments that met the eligibility criteria were reviewed to determine if they were also suitable for inclusion in the NWSRS. The Wild and Scenic River Act and BLM Manual 8351 list a number of factors that should be considered when assessing the suitability of waterways for inclusion in the NWSRS. Of the nine eligible waterway segments and waterway units, two were also found to be suitable for designation: the Baldwin Creek and the Sweetwater River segments.

Several factors caused eligible waterways to be recommended as not suitable for inclusion in the NWSRS. These factors included management conflicts and/or challenges due to adjacent non-BLM-administered land, use conflicts on private and/or public lands in the waterway corridor that could be incompatible with inclusion in the NWSRS, the effectiveness of current non-WSR management in protecting the identified outstandingly remarkable values, and determinations that the segments were not worthy of WSR designation. Refer to the Lander Field Office Review of Potential Wild and Scenic Rivers in the Lander RMP Planning Area (BLM 2002a) for additional detail on the suitability determinations. The BLM evaluated the constraints that lead to the determination that the Warm Springs Creek did not meet the “suitable” criteria. A withdrawal for power that appeared to conflict with WSR suitability is now considered non-determinative of suitability. Instead the BLM has found that to provide for seamless management with the Shoshone National Forest, segment 1 of the Warm Springs Unit will be recommended as suitable. The BLM will pursue removal of the Power Withdrawal that exists on this parcel.

The interim management prescriptions are designed to protect or enhance the identified outstandingly remarkable values and maintain the tentative classifications assigned to these waterways. The BLM has determined that the management associated with these existing special designations is sufficient to protect these waterways; therefore, the BLM has developed no additional interim management prescriptions. Chapter 2 of this document identifies the current management of these waterways.

3.7.4. Areas of Critical Environmental Concern

An ACEC is defined in FLPMA, Section 103(a) as an area within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, and scenic values, fish and wildlife, and other natural systems or processes. ACECs are also designated to protect life and ensure safety from natural hazards. Designation of ACECs during revisions of land use plans is mandatory under FLPMA: “In the development and revision of land use plans, the Secretary shall ... give priority to the designation and protection of areas of critical environmental concern ...” FLPMA, Section 202(c)(3). BLM regulations for implementing the ACEC provisions of FLPMA are found at 43 CFR 1610.7-2(b).

As per 3809.11(c), an ACEC designation carries the following management prescription: a 3809-Plan of Operations is required for operations causing surface disturbance greater than casual use. Without ACEC designation, a Plan of Operations is required only for locatable mineral mining activities, exploration causing more than 5 acres of disturbance, and bulk sampling of 1,000 tons or more. All other management prescriptions are developed on a site-specific basis, depending on the resources to be protected and the identified threats to those resources.

The Lander Field Office currently manages nine ACECs in the planning area (Map 130):

- Lander Slope
- Red Canyon
- Dubois Badlands
- Whiskey Mountain
- East Fork
- Beaver Rim
- Green Mountain
- South Pass Historic Mining District
- National Historic Trails

In addition to these existing ACECs, the BLM received a number of recommendations for expanding existing ACECs and for new ACECs through public and internal scoping processes. The BLM reviewed all such recommendations to determine if they met the importance and relevance criteria required for consideration as an ACEC. Of the nominations received, four new proposed ACECs met the criteria, as did expansion areas adjacent to five existing ACECs.

Table 3.61, “Existing and Proposed ACECs in the Planning Area” (p. 518) lists the existing and proposed ACECs, their acreage, and the value(s) of concern that justify their consideration as ACECs.

Table 3.61. Existing and Proposed ACECs in the Planning Area

Area	Acreage (BLM-administered surface)		Value(s) of Concern
	Existing	Proposed	
Existing ACECs (no expansion proposed)			
Lander Slope	25,065	N/A	Fish and wildlife, scenic values, natural processes
Red Canyon	15,109	N/A	Wildlife, special status species, scenic values, geologic features
Dubois Badlands	4,903	N/A	Wildlife, soils, scenic values
Whiskey Mountain	8,776	N/A	Wildlife, scenic values
Existing ACECs (and proposed expansion)			
East Fork	4,431	7,744	Wildlife
Beaver Rim	6,421	20,532	Fish and wildlife, plant communities, scenic values, geologic features, paleontological
Green Mountain	14,612	24,860	Wildlife, plant communities
South Pass Historic Mining Area	12,576	23,439	Hazards, cultural
South Pass Historical Landscape ¹	N/A	124,229	Hazards, cultural
National Historic Trails	27,728	468,183	Scenic values, cultural
Proposed ACECs			
Continental Divide National Scenic Trail	N/A	259,380	Scenic
Cedar Ridge	N/A	7,039	Cultural
Castle Gardens	N/A	8,469	Cultural
Sweetwater Rocks	N/A	152,347	Scenic values, geologic features, cultural
Regional Historic Trails and Early Highways	N/A	89,016	Cultural
Government Draw/Upper Sweetwater Sage-Grouse	N/A	1,246,791	Wildlife

Area	Acreage (BLM-administered surface)		Value(s) of Concern
	Existing	Proposed	
Twin Creek ²	N/A	35,102	Wildlife
Source: BLM 2010e ¹ The proposed South Pass Historical Landscape ACEC is designated under Alternative D. The existing South Pass Historic Mining Area ACEC is contained within the boundaries of the proposed South Pass Historical Landscape ACEC. ² The proposed Twin Creek ACEC is designated under Alternative D and is contained within the area proposed as the Government Draw/Upper Sweetwater Sage-Grouse ACEC under Alternative B. ACEC Area of Critical Environmental Concern BLM Bureau of Land Management N/A Not Applicable			

3.7.4.1. Existing ACECs

This section describes the existing ACECs in the planning area (Map 130). Chapter 2 of this document provides specific management prescriptions for existing ACECs.

Lander Slope

The Lander Slope ACEC consists of 25,065 acres of BLM-administered surface of high-elevation slopes and drainages south and west of Lander (Map 130). Most of the area consists of high-elevation slopes and drainages covered by mountain shrub communities, with smaller areas of forest and wet meadow communities. Resources that met the ACEC importance and relevance criteria in the 1987 RMP were fish and wildlife, scenic values, and natural processes. Those resources continue to meet the criteria for this RMP revision. The ACEC provides crucial winter range for elk and mule deer, and supports a large percentage of the South Wind River elk herd. This elk herd provides hunting opportunities for both resident and nonresident hunters and revenue to local economies. Several of the steep canyons provide habitat for bighorn sheep and peregrine falcons, a BLM sensitive species. The Lander Slope is visible from Lander and Sinks Canyon State Park and its prominence from these vantage points makes it a visually sensitive area. The ACEC is also an important component of the watershed that supplies water to Lander; a potential for flooding in Lander from the Popo Agie River makes watershed management in this area important.

Management challenges for this area include development pressure and impacts from surface-disturbing activities. The area is important winter wildlife habitat and contains scenic vistas susceptible to the impacts of development, mining, ROWs, habitat fragmentation, motorized vehicle use, and the expansion of existing invasive plant species infestations. In addition, the ACEC has WUI issues related to fire and fuels management and steep slopes sensitive to erosion. At present, the BLM manages the area as VRM Classes II and III; mineral and realty actions in the ACEC are open with major constraints, and travel is limited to designated roads and trails with seasonal limitations.

Red Canyon

The Red Canyon ACEC consists of 15,109 acres of BLM-administered surface of high-elevation slopes and drainage in the foothills of the Wind River Mountains south and west of Lander (Map 130). Resources that met the ACEC importance and relevance criteria in the 1987 RMP were wildlife, special status species, scenic values, and geologic features. Those resources continue to meet the criteria for this RMP revision. The ACEC, which is part of the WGFD Red Canyon

Habitat Management Unit, contains crucial winter range for elk and mule deer and supports a large percentage of the South Wind River elk herd. This elk herd provides hunting opportunities for both resident and nonresident hunters and revenue to the local economy. There are five sensitive plant species known to occur in the area (Barneby's clover, Beaver Rim phlox, Fremont bladderpod, Rocky Mountain twinpod, and persistent sepal yellowcress), of which one species is only known to occur in this area (Barneby's clover).

Red Canyon has the highest visual sensitivity of any landscape in the planning area and is a draw for visitors, artists, and photographers. The geology of the ACEC provides an example of differential erosion of sedimentary layers, with the harder layers of sandstone and limestone forming cliffs and benches and the easily eroded shales and siltstones forming valleys and gulches. Color variation between the rock layers allows non-geologists a chance to understand the stratigraphy and structure of the canyon. The southern portion of the Red Canyon ACEC was designated a NNL in recognition of these geologic values.

Management challenges for this area include development pressure and impacts from surface-disturbing activities (e.g., phosphate mining), motorized vehicle use, and invasive plant species. The area contains nationally recognized visual resources and important wildlife habitat (corridors and crucial winter range) threatened by visual intrusions from development and habitat fragmentation. Much of the private land adjoining the ACEC has been subdivided, increasing pressure on these public lands to meet wildlife needs. The expansion of existing invasive plant infestations in the area could affect sensitive plant species, potentially leading to ESA listing. The ACEC also has steep slopes sensitive to erosion. At present, the BLM manages the area as VRM Classes I and II; mineral and realty actions in the ACEC are open with major constraints (except the NNL and crucial winter range, which are closed to phosphate leasing); and travel is limited to designated roads and trails with seasonal limitations.

Dubois Badlands

The Dubois Badlands ACEC consists of 4,903 acres of BLM-administered surface at the northwest corner of the planning area bordering the WRIR along the north bank of the Wind River to 2 miles west of Dubois (Map 130). The area consists of badlands characterized by extensive erosion patterns and colorful soil banding. Resources that met the ACEC importance and relevance criteria in the 1987 RMP were wildlife, soils, and scenic values. Those resources continue to meet the criteria for this RMP revision. The area provides year-round habitat for a resident herd of bighorn sheep and hunting opportunities. The Dubois Badlands are highly visible from the town of Dubois and along an important travel route to Yellowstone and Grand Teton National Parks. The badland soils (variegated claystones, silt stones, and sandstones from the Wind River and Indian Meadows Formations) in the ACEC are highly erosive and scenic due to their red, gray, and purple banding.

Management challenges for this area include impacts of motorized vehicle use on soil, and bighorn sheep. Additionally, due to its location, any activity that would change the characteristic landscape of this area would be highly visible and could affect scenic values. At present, the BLM manages the area as VRM Classes I and II; mineral and realty actions in the ACEC are open with major constraints; and travel is limited to designated roads and trails with seasonal limitations.

Whiskey Mountain

The Whiskey Mountain ACEC consists of 8,776 acres of BLM-administered surface on Whiskey Mountain south and southeast of Dubois (Map 130). The ACEC contains high-elevation,

wind-swept slopes and rocky cliffs. Resources that met the ACEC importance and relevance criteria in the 1987 RMP were wildlife and scenic values. Those resources continue to meet the criteria for this RMP revision. The area provides crucial winter range for the Whiskey Mountain bighorn sheep herd (managed as the WGFD Whiskey Mountain Wildlife Habitat Management Unit), one of the largest and most visible herds in North America. The area has been the site of active land acquisition by the BLM and a conservation easement by The Nature Conservancy to protect this herd.

The Whiskey Mountain ACEC is an economic driver for Dubois, making it not just a gateway to Yellowstone and Grand Teton National Parks but also a tourism destination. In the period following the initial ACEC designation, there has been substantial economic investment in the town of Dubois focusing on bighorn sheep. Perhaps the most important of these, but not the only example, is the establishment of the National Bighorn Sheep Center on the main street through Dubois heading towards the national parks.

Management challenges for this area include stresses on bighorn sheep and development activities. The resident bighorn sheep herd is recovering from a decline in the 1990s due to extreme winter conditions and remains vulnerable to additional stresses, (e.g., human disturbance, disruptions in forage supply, diseases from domestic sheep and goats, and predation). To ensure adequate forage is available for wintering bighorn sheep and to minimize disturbances, most of the ACEC is currently closed to domestic livestock grazing and is closed to motorized vehicle use during the winter. The area is within view of the Fitzpatrick Wilderness Area (USFS), and visitors to that area might be sensitive to visual changes in the ACEC. At present, the BLM manages the area as VRM Classes I and II; mineral and realty actions in the ACEC are closed and predominantly withdrawn; and travel is limited to designated roads and trails with seasonal limitations.

3.7.4.2. Existing ACECs with Proposed Expansions

This section describes existing ACECs in the planning area that have proposed expansion areas. Chapter 2 of this document provides specific management prescriptions for existing ACECs and proposed expansions.

East Fork

The East Fork ACEC consists of 4,431 acres of BLM-administered surface in the drainages of the East Fork of the Wind River, Wiggins Fork, Bear Creek, and Alkali Creek 5 miles northeast of Dubois (Map 130). The area consists of high elevation, wind-swept slopes and sagebrush draws near timber patches. The resource that met the ACEC importance and relevance criteria in the 1987 RMP was wildlife. This resource continues to meet the criteria for this RMP revision. The area is crucial winter habitat for elk and is managed as part of the Inberg/Roy Wildlife Habitat Management Area, which contains interspersed BLM- and WGFD-administered lands. This elk herd is one of the largest not supported by a state or federal feed ground.

The primary management challenge for this area is habitat fragmentation. Development in the Dubois area on private lands and pine beetle infestation in surrounding areas are the primary causes of fragmentation. The area is currently closed to livestock grazing to allow sufficient forage for big game. At present, the BLM manages mining and leasing actions in the ACEC as closed/withdrawn and avoided, and travel is limited to existing roads and trails.

Proposed Expansion

The proposed expansion of the East Fork ACEC would include land in the Spence/Moriarity Wildlife Management Area and areas adjacent to the USFS and WRIR boundaries northeast of the Spence/Moriarity Wildlife Management Area and would expand the ACEC to 7,745 acres of BLM-administered surface (Map 131). As with the existing ACEC, the proposed expansion contains wildlife resources related to elk winter habitat. Management challenges for the existing ACEC also apply to the expansion. At present, BLM-administered lands in the proposed expansion area are open to livestock grazing.

Beaver Rim

The Beaver Rim ACEC consists of 6,421 acres of BLM-administered surface in south-central Fremont County, north and west of Sweetwater Station (Map 130). The Beaver Rim ACEC is an east-west trending escarpment that separates the Sweetwater River drainage basin from the Wind River drainage basin. Resources that met the ACEC importance and relevance criteria in the 1987 RMP were fish and wildlife, geologic features, paleontological values, plant communities, and scenic values. Those resources continue to meet the criteria for this RMP revision. Beaver Rim provides nesting habitat and hunting perches for many raptor species, with rock wall cavities, rock ledges, and trees located above, below, or within the rim typically used for nesting. Several Wyoming BLM sensitive plant species are found on the shallow soils and rocky slopes along the rim. The topographical and soil characteristics in the area also create a micro-climate in isolated pockets along the rim, which contain plant communities typical of a moister climate (e.g., Douglas-fir stands and riparian-wetland areas). Geologically, the area contains an unusually complete sequence of Tertiary deposits representative of the Early Eocene Epoch (about 53 million years BP) through the Middle Miocene Epoch (about 10 million years BP). The ACEC is also representative of the deflational and erosional boundary between the degrading Wind River Basin to the north and west, and the stable upland Sweetwater Plateau. Fossil remains occur in the exposed stratigraphy along Beaver Rim. Although not found to meet importance and relevance criteria, the ACEC area also contains numerous archeological sites, some of which are important to local tribes.

Management challenges for this area include ROW development, particularly wind-energy development, and other disturbances. The scenic horizontal feature of the rim is vulnerable to visual disturbances from vertical developments and erosion due to surface disturbance. Because of their fragile nature, the geologic features in the ACEC are also vulnerable to degradation. At present, the BLM manages the area as VRM Classes II through IV; mineral and realty actions in the ACEC are open with moderate or no constraints and restrictions; and travel is limited to existing roads and trails.

Proposed Expansion

The proposed expansion of the Beaver Rim ACEC would encompass a larger portion of the Beaver Rim and would expand the ACEC to 20,532 acres of BLM-administered surface (Map 131). As with the existing ACEC, the proposed expansion area contains fish and wildlife, geological and paleontological resources, plant communities, and scenic values. The proposed expansion would include the entire portion of this scenic feature as viewed from U.S. Highway 287, a sensitive observation route. The proposed ACEC expansion area is also important for the preservation of volcanic deposits derived from the Yellowstone-Absaroka volcanic field to the northwest, and the Rattlesnake volcanic field to the east. Management challenges for the existing ACEC also apply to the expansion area.

Green Mountain

The Green Mountain ACEC consists of 14,612 acres of BLM-administered surface on the north slopes of Green Mountain and Crooks Mountain in southeast Fremont County, south of Jeffrey City (Map 130). The area is characterized by sagebrush grasslands at the lower elevations and conifers at the mid to higher elevations. Resources that met the ACEC importance and relevance criteria in the 1987 RMP were wildlife and plant communities. Those resources continue to meet the criteria for this RMP revision. The area contains important elk winter range and constitutes almost all of the winter range for the Green Mountain elk herd. The important plant communities in this area are the riparian-wetland systems scattered throughout the ACEC, including wet meadow complexes formed by beaver dams. Though it did not meet the importance and relevance criteria, the ACEC also contains the locally important Sparhawk Cabin, which F.O. Sparhawk, the first USFS ranger on the Shoshone National Forest, built in the 1930s. The ACEC receives public use in the form of hunting, fishing, camping, and firewood gathering.

The primary management challenge for this area is energy development. Energy development activity could result in the loss or alteration of the elk crucial winter range, which could threaten the viability of the Green Mountain herd. The area has historically undergone intensive exploration and development for uranium and, to a lesser degree, oil and gas. The resurgence of the uranium market has resulted in renewed mining activity in the area. There has also been increased interest in wind-energy development and drilling for oil and gas in and surrounding the ACEC. In addition to energy development, vegetation in the area is vulnerable to recreation, livestock grazing, and wild horse grazing. At present, the BLM manages the area as VRM Classes II and III; mineral and realty actions in the ACEC are open with major constraints (except around campgrounds and picnic sites, which are withdrawn); and travel is limited to designated roads and trails.

Proposed Expansion

The proposed expansion of the Green Mountain ACEC would include lands south of the existing ACEC and would expand the ACEC to 24,860 acres of BLM-administered surface (Map 131). As with the existing ACEC, the proposed expansion contains wildlife resources. In addition, the expansion area includes elk parturition area near the top of Green Mountain which is the only designated parturition range for the Green Mountain elk herd. This portion of Green Mountain consists of open sagebrush surrounded by forested areas. Management challenges for the existing ACEC also apply to the expansion.

South Pass Historic Mining Area

The South Pass Historic Mining Area ACEC is 12,576 acres of BLM-administered surface, consisting of a historic gold mining region southwest of Lander (Map 130). The ACEC has both sagebrush steppe and forested areas, with steep to rolling hills. The value that met the ACEC importance and relevance criteria in the 1987 RMP was cultural resources. For the current RMP revision, cultural resources and hazards (abandoned mines) are the resources that have met the importance and relevance criteria. The area contains important historic resources from mining activities. Historic resources range from early mining towns like Miner's Delight and South Pass City to numerous prospect holes. Many of these resources are still intact and visited by the public. However, abandoned mines resulting from this activity now constitute hazards to the public. Abandoned mine shafts and adits can be dangerous to visitors, and some of the tailings and deteriorated construction materials are hazardous and/or unstable.

Management challenges for this area primarily include the preservation of cultural resources and the reclamation of unsafe mines. Due to the fragile nature of the historic sites in the ACEC, these

resources are vulnerable to effects from development, looting and vandalism, and wildland fire. The reclamation of dangerous abandoned mine sites can be problematic because the BLM and the State of Wyoming have not yet been able to alleviate all hazards. At present, the BLM manages the area as VRM Classes II through IV; mineral and realty actions in the ACEC are open with major constraints (except a portion that is withdrawn); and travel is limited to existing roads and trails with seasonal limitations.

Proposed Expansion

The proposed expansion of the South Pass Historic Mining Area ACEC would include lands adjacent to the existing ACEC and would expand the ACEC to 23,439 acres of BLM-administered surface under Alternative B (Map 131). Under Alternative D, the South Pass Historic Mining Area would be located within the newly designated South Pass Historical Landscape ACEC (124,229 acres) (Map 132). As with the existing ACEC, the proposed expansions contain cultural resources and hazards associated with historic mining activities. In addition, the area proposed as the South Pass Historical Landscape ACEC contains 27.15 miles of Congressionally Designated Trails. Historic resources in the proposed expansions include historic ditches, dredging, and structures. The risks posed by abandoned mines in the expansion areas are perhaps even more pronounced than in the existing ACEC because of the areas' remoteness and limited public knowledge of the hazards. Management challenges for the existing ACEC also apply to the expansions. Additional management challenges associated with the proposed South Pass Historical Landscape ACEC include protecting the NHTs and their settings from surface-disturbing activities and other activities.

National Historic Trails ACEC

Discussion of the NHTs ACEC and proposed expansion is provided within the *Congressionally Designated Trails* section.

3.7.4.3. Proposed ACECs

This section describes the areas proposed as new ACECs (Map 131 and Map 132). Chapter 2 of this document provides specific management prescriptions for proposed ACECs.

Continental Divide National Scenic Trail

Discussion of the CDNST proposed ACEC is provided within the *Congressionally Designated Trails* section.

Cedar Ridge

The proposed Cedar Ridge ACEC consists of approximately 7,039 acres of BLM-administered surface in northeastern Fremont County (Map 131). Cedar Ridge is a northwest-southeast trending ridge in central Wyoming. It is on the southwestern edge of the Bighorn Mountain Range and overlooks a large part of the Wind River Basin to the south. The resources that meet the ACEC importance and relevance criteria are cultural, and Cedar Ridge has been determined by the BLM and Wyoming SHPO as eligible for listing on the NRHP as both a TCP and a prehistoric archeological resource. The Cedar Ridge TCP was recognized in 1997 as sacred to several tribes. This locality has been used for more than 5,500 years as a ceremonial site for prayers and rituals, and represents a sacred place for Eastern Shoshone religious observances. Due to the fragile nature of the remains in this TCP, these resources are vulnerable to development and

other types of disturbance. Changes to this area could create conflicts with traditional Eastern Shoshone religious beliefs or practices. At present, the BLM manages the area of the proposed ACEC as VRM Classes II through IV; mineral and realty actions in the area are open; and travel is limited to existing roads and trails.

Castle Gardens

The proposed Castle Gardens ACEC consists of approximately 8,469 acres of BLM-administered surface in the eastern portion of the Wind River Basin (Map 131). The Castle Gardens area consists of a rugged and broken landscape containing uplifted layers of sandstone, shale, and coal exposed along a northwest-southeast trending anticline. The area's shallow soils support a varied vegetative community. The resources that meet the ACEC importance and relevance criteria are cultural. The east end of Castle Gardens has a concentration of regionally significant prehistoric rock art which is listed on the NRHP. It contains a large number of painted and incised prehistoric rock art, and is generally recognized as one of the best shield motif rock art sites in the Northern High Plains. The site is also considered sacred by several tribes, such as the Eastern Shoshone and Northern Arapaho. Vegetation communities in the area, although they do not meet importance and relevance criteria, contain many relic plant communities that could have been related to the prehistoric settlement of the area.

The existing plan recognized the important cultural values associated with the Northern High Plains shield motif rock art at Castle Gardens, but did not designate the site as an ACEC. Management prescriptions have thus far not reversed the deterioration of the site from vandalism, natural deterioration, and neglect. At present, the BLM manages the immediate site area as VRM Class II; mineral and realty actions in the area are closed, withdrawn, and excluded. The rest of the proposed ACEC is open to mineral and realty actions and is managed as VRM Class III and IV.

Sweetwater Rocks

The proposed Sweetwater Rocks ACEC consists of approximately 152,347 acres of BLM-administered surface in the Granite Mountain Range, starting at Long Creek Mountain east to the Sentinel Rocks, in Fremont, Natrona, and Carbon Counties (Map 131). The Sweetwater Rocks portion of the Granite Mountain Range consists of four WSAs: Lankin Dome, Savage Peak, Miller Springs, and Split Rock. Resources that met the ACEC importance and relevance criteria were geologic, cultural, and scenic. The Granite Mountains-Sweetwater Rocks area represents a preserved landscape from Wyoming's geologic past, unique in Wyoming for its mountain tops' partial burial in upper Tertiary sedimentary deposits. Other mountain ranges in Wyoming have been almost entirely exhumed, and the Tertiary sedimentary record destroyed by erosion. The geologic history that caused this phenomenon has also resulted in uranium ore deposits and jade and agate occurrences. Scenic values in the area include large granite spires, domes, and peaks, which the most recent VRI found to be one of the most scenic areas in the planning area. The Granite Mountains are a focal point for travelers along State Highways 220 and 287, where there are several rest areas, scenic pullouts, and interpretive facilities. Climbing in the Granite Mountain area is a rapidly increasing activity. Cultural values in the area include landmarks used during the historic western migration through this portion of Wyoming (e.g., Devil's Gate, Split Rock, Three Crossings, and Independence Rock).

Threats to the proposed ACEC include damage to scenic or cultural values from surface disturbance. Observers from Highways 220 and 287 and recreational users could be sensitive to changes to the form, color, and texture of the landscape resulting from such activities. At present,

the BLM manages the area of the proposed ACEC as VRM Classes I through IV; mineral and realty actions in the area are open (except within the WSA).

Regional Historic Trails and Early Highways

The proposed Regional Historic Trails and Early Highways ACEC consists of approximately 89,016 acres of BLM-administered surface along regionally significant historic trails and early highways that run through various parts of the planning area (Map 131). These trails and highways include the Bridger Trail, the Casper to Lander Stage Road, the Rawlins-Fort Washakie Stage Trail, the Green River-Fort Washakie Stage Road, the Birdseye Pass Stage Trail, the Point of Rocks to South Pass Stage Trail, the Yellowstone Highway, and the National Park to Park Highway. The resource that meets the ACEC importance and relevance criteria is cultural. These trails and early highways were in use from the 1860s until the 1920s and were considered important components of efforts during this time to settle and expand industry in Wyoming. All the historic trails and highways are eligible for nomination to the NRHP and are of at least statewide significance. Due to the fragile nature of the historic trails, these resources are vulnerable to surface-disturbing and other activities. At present, mineral and realty actions in the area are open (except within $\frac{1}{4}$ mile or the visible horizon, which are open with moderate constraints), and travel is limited to existing roads and trails on non-historic roads.

Government Draw/Upper Sweetwater Sage-Grouse

The proposed Government Draw/Upper Sweetwater Sage-Grouse ACEC under Alternative B consists of approximately 1,246,791 acres of BLM-administered surface east of Lander and south of the WRIR to its boundary with the Sweetwater River (Map 131). The proposed ACEC consists of sagebrush-steppe habitat intermixed with riparian-wetland habitats ranging in elevation from approximately 5,080 feet to 8,760 feet. The resource that meets the ACEC importance and relevance criteria is wildlife. The area contains breeding, nesting, brood-rearing, and winter habitats for greater sage-grouse. There are 87 occupied and 8 unoccupied leks within the proposed boundary of the ACEC. Breeding and nesting occurs throughout sagebrush-grass habitats in the area and brood-rearing occurs predominantly in riparian-wetland habitats south of U.S. Highway 287. The area of the proposed ACEC has one of the greatest densities of male greater sage-grouse per square mile in Wyoming and is considered to be an important component in the conservation of greater sage-grouse throughout its range.

The area consists of relatively undisturbed greater sage-grouse habitat, and several research projects have been conducted in the area that have statewide application. Because of the knowledge about greater sage-grouse numbers and population trends, their seasonal ranges, and the opportunity to use the area to study greater sage-grouse, this area was nominated by the Wind River-Sweetwater River Sage-Grouse Local Working Group and the WGFD for ACEC designation. Greater sage-grouse winter use areas are found throughout the proposed ACEC, although the greatest amount of winter use occurs in the taller sagebrush stands in the northern half of the proposed area. Increased interest in wind-energy development and CBNG projects in the area in recent years could affect the greater sage-grouse population and its seasonal habitats. At present, mineral and realty actions in the area are open with greater sage-grouse considerations, and travel is limited to existing roads and trails.

A small portion of the area proposed as the Government Draw/Upper Sweetwater Sage-Grouse ACEC under Alternative B that straddles State Highway 287 to the southwest of Lander in the Hudson to Atlantic City area is designated as the Twin Creek ACEC under Alternative D (35,102 acres) (Map 132). The proposed Twin Creek ACEC has the same values of concern as the

proposed Government Draw/Upper Sweetwater Sage-Grouse ACEC. There are seven occupied and one unoccupied leks within the proposed boundary of the Twin Creek ACEC. The area has high bentonite potential that, if developed, would fragment greater sage-grouse habitat and connectivity in the area. Because the proposed Twin Creek ACEC is contained within the area proposed as the Government Draw/Upper Sweetwater Sage-Grouse ACEC, current management of the two areas is similar.

3.8. Socioeconomic Resources

This section addresses social conditions, economic conditions, public health and safety, environmental justice, and tribal treaty rights. Each resource section describes the resource, the existing condition of the resource, and management challenges and actions related to the resource, as appropriate.

The social and economic data on which the following analysis is based are from the period prior to the economic downturn that began nationally in 2007. Although the impact of the recession was not felt generally in Wyoming until much later than the nation as a whole, the rapid decrease in the price of petroleum equivalents was felt immediately in Wyoming, with resulting impacts to the oil and gas industries.

3.8.1. Social Conditions

Management decisions on BLM-administered lands have the potential to impact surrounding communities and state and private lands, and the BLM must consider such impacts. This section provides a framework for analysis of potential impacts to social conditions in the planning area.

Human social conditions are related to towns, cities, rural areas, and the custom, culture, history, and existing social values. BLM management actions can impact social conditions in the planning area and in nearby communities; therefore, this section describes conditions for an area larger than the planning area (the study area). The study area is comprised of the entire counties of Carbon, Fremont, Hot Springs, Natrona, and Sweetwater. While the planning area crosses all five counties, it contains only small portions of Natrona, Carbon, Hot Springs, and Sweetwater Counties and primarily lies in Fremont County. Therefore, social conditions in Fremont County most accurately reflect social conditions in the planning area. An additional important component of the study area is the WRIR, which is in Fremont and Hot Springs Counties, and data in this section for those counties includes people living on the WRIR. This section also includes some WRIR specific information.

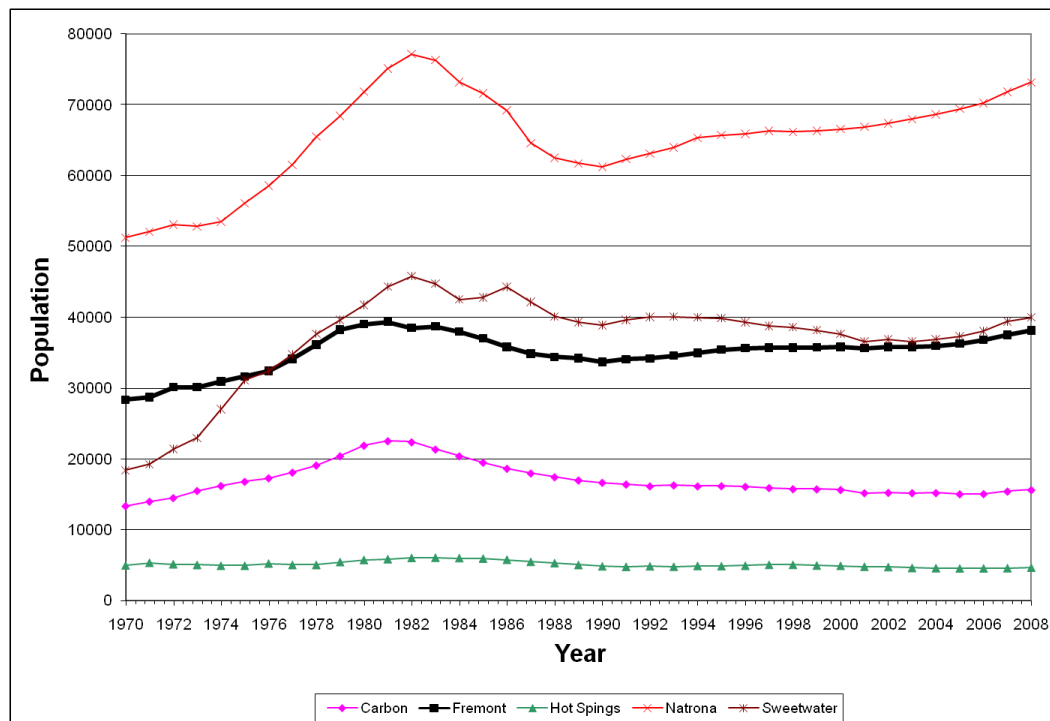
The following sub-sections summarize population and demographic information for the study area, including housing, customs and social trends, public safety and educational services. Social conditions are often based on a wide range of community and demographic characteristics and involve broad areas of community interest.

Population and Demographics

In 2008, Natrona was the most populous county in the study area, with 73,129 people; Carbon County had a population of 15,624; Fremont County had a population of 38,113; Hot Springs County had a population of 4,622; and Sweetwater County had a population of 39,944 (Wyoming Economic Analysis Division 2009a). Except for Hot Springs County, populations in each of these counties increased in the late 1970s and early 1980s during the oil and gas boom, and decreased

following the oil bust in the mid-1980s. By comparison, the population of Wyoming in 2008 was 529,630 (Wyoming Economic Analysis Division 2009a).

Figure 3.20, “Population Trends in Carbon, Fremont, Hot Springs, Natrona, and Sweetwater Counties, Wyoming, 1970-2008” (p. 528) shows population trends for the five counties from 1970 to 2008. Since 1990, the population has stayed relatively constant in Hot Springs County, increased steadily in Natrona and Fremont Counties, decreased slightly in Carbon County, and, until 2000, decreased in Sweetwater County (Sweetwater County has recently seen a population increase).



Sources: BEA 2009; Wyoming Economic Analysis Division 2009b

Figure 3.20. Population Trends in Carbon, Fremont, Hot Springs, Natrona, and Sweetwater Counties, Wyoming, 1970-2008

The WRIR encompasses approximately 2.2 million acres, primarily in Fremont County, with a portion in Hot Springs County. The 2000 Census reported a population of about 23,000 within the boundaries of the WRIR, including about 6,500 Native Americans (Headwaters Economics 2009a). About two-thirds of the Native American population is Northern Arapaho, about one-third is Eastern Shoshone (Massey 2004).

The Northern Arapaho tribe filed a lawsuit against Fremont County and the State of Wyoming in late 2008 challenging the boundaries of the WRIR (Merrill 2008). Depending on the outcome of the lawsuit, the reservation boundaries may be amended to include an area north of the Big Wind River and east of the Popo Agie River; which could influence population and demographic conditions. Native Americans living in this area would also be exempt from certain state and county taxes and vehicle registration fees (Merrill 2008).

Table 3.62, “Population of Counties and Towns Over Time in the Study Area” (p. 529) summarizes the population of each county and the incorporated cities and towns in each county. The largest

city in the study area is Casper, the county seat of Natrona County; the second largest is Rock Springs, the county seat of Sweetwater County. Neither of these cities are in the planning area. The only incorporated towns and cities in the planning area are in Fremont County. The largest city in the planning area is Riverton.

A substantial proportion of the population in the study area lives outside incorporated cities and towns. For example, about half of Fremont County's population lives outside incorporated areas. In contrast, about 15 percent of the population in Carbon, Natrona, and Sweetwater Counties, and about 30 percent in Hot Springs County, live outside cities and towns (Table 3.62, "Population of Counties and Towns Over Time in the Study Area" (p. 529)). This population pattern contributes to the small-town character of the area.

Table 3.62. Population of Counties and Towns Over Time in the Study Area

Area	1990	2000	2008	Percent Change (1990-2000)	Percent Change (2000-2008)	Percent Change (1990-2008)
Fremont County	33,662	35,804	38,113	+6.4	+6.4	+13.2
Dubois town	895	964	1,053	+7.7	+9.2	+17.7
Hudson town	392	407	429	+3.8	+5.4	+9.4
Lander city	7,023	6,914	7,264	-1.6	+5.1	+3.4
Pavillion town	126	165	169	+31.0	+2.4	+34.1
Riverton city	9,202	9,251	10,032	+0.5	+8.4	+9.0
Shoshoni town	497	635	689	+27.8	+8.5	+38.6
Unincorporated Areas ¹	15,527	17,468	18,477	+12.5	+5.8	+19.0
Carbon County	16,659	15,639	15,624	-6.1	-0.1	-6.2
Baggs town ²	272	348	400	+27.9	+14.9	+47.1
Dixon town ²	70	79	81	+12.9	+2.5	+15.7
Elk Mountain town ²	186	192	200	+3.2	+4.2	+7.5
Grand Encampment town ²	490	443	452	-9.6	+2.0	-7.8
Hanna town ²	1,076	873	866	-18.9	-0.8	-19.5
Medicine Bow town ²	389	274	267	-29.6	-2.6	-31.4
Rawlins city ²	9,380	9,008	8,740	-4.0	-3.0	-6.8
Riverside town ²	85	59	63	-30.6	+6.8	-25.9
Saratoga town ²	1,969	1,726	1,759	-12.3	+1.9	-10.7
Sinclair town ²	500	423	405	-15.4	-4.3	-19.0
Unincorporated Areas ¹	2,242	2,214	2,391	-1.2	+8.0	+6.6
Hot Springs County	4,809	4,882	4,622	+1.5	-5.3	-3.9
East Thermopolis town ²	221	274	264	+24.0	-3.6	+19.5
Kirby town ²	59	57	55	-3.4	-3.5	-6.8
Thermopolis town ²	3,247	3,172	2,971	-2.3	-6.3	-8.5
Unincorporated Areas ¹	1,282	1,379	1,332	+7.6	-3.4	+3.9
Natrona County	61,226	66,533	73,129	+8.7	+9.9	+19.4
Bar Nunn town ²	835	936	1,828	+12.1	+95.3	+118.9
Casper city ²	46,765	49,740	54,047	+6.4	+8.7	+15.6
Edgerton town ²	247	169	176	-31.6	+4.1	-28.7
Evansville town ²	1,486	2,259	2,393	+52.0	+5.9	+61.0
Midwest town ²	495	408	435	-17.6	+6.6	-12.1
Mills town ²	2,267	2,832	3,143	+24.9	+11.0	+38.6
Unincorporated Areas ¹	9,131	10,189	11,107	+11.6	+9.0	+21.6
Sweetwater County	38,823	37,613	39,944	-3.1	+6.2	+2.9
Bairoil town ²	228	97	96	-57.5	-1.0	-57.9
Granger town ²	126	146	145	+15.9	-0.7	+15.1
Green River city ²	12,711	11,808	12,149	-7.1	+2.9	-4.4

Area	1990	2000	2008	Percent Change (1990-2000)	Percent Change (2000-2008)	Percent Change (1990-2008)
Rock Springs city ²	19,050	18,654	20,200	-2.1	+8.3	+6.0
Superior town ²	273	244	237	-10.6	-2.9	-13.2
Wamsutter town ²	240	261	269	+8.8	+3.1	+12.1
Unincorporated Areas ¹	6,195	6,403	6,848	+3.4	+6.9	+10.5
State of Wyoming	453,588	493,782	529,630	+8.9	+7.3	+16.8

Sources: Wyoming Economic Analysis Division 2009a; Wyoming Economic Analysis Division 2002
¹ Might include some people who live in the county but outside the Lander Field Office boundaries.
² These cities are outside the Lander Field Office boundaries, but within the five-county study area.

There have been changes in the distribution of different age groups in the study area. Since 1990, the proportion of people age 60 and over and those aged 40 to 59 have increased in all five counties. However, the proportion of people age 20 to 39 and the proportion of school age children (age 5 to 19) have decreased. One implication of this change is declining enrollments in primary and secondary schools, a trend addressed later in this section. Table 3.63, “Change in Population Age Groups in Study Area Counties, 1990-2008” (p. 530) summarizes the changing demographics in each county. As the table shows, the trend toward an older population (higher percentage of residents over age 40) is also a statewide trend.

Table 3.63. Change in Population Age Groups in Study Area Counties, 1990-2008

	Fremont			Carbon			Hot Springs		
Percent of population in age group	1990	2000	2008	1990	2000	2008	1990	2000	2008
Percent aged 0-4	8	7	8	7	6	7	5	5	5
Percent aged 5-19	26	24	20	25	21	18	23	20	14
Percent aged 20-39	28	23	24	31	25	25	24	18	20
Percent aged 40-59	22	28	28	23	31	32	23	30	29
Percent aged 60 and over	16	18	20	14	17	19	25	27	32
	National			Sweetwater			Wyoming		
Percent of population in age group	1990	2000	2006	1990	2000	2006	1990	2000	2006
Percent aged 0-4	8	6	7	8	7	9	8	6	7
Percent aged 5-19	24	23	20	29	26	21	25	23	20
Percent aged 20-39	31	26	27	32	26	26	31	26	27
Percent aged 40-59	21	28	28	21	30	30	21	29	29
Percent aged 60 and over	15	17	17	10	11	14	14	16	18

Sources: U.S. Census Bureau 1990; U.S. Census Bureau 2000a; Wyoming Economic Analysis Division 2009c

Table 3.64, “Population Age Groups by Race and Ethnicity in Select Areas, 2000” (p. 531) lists age groups in 2000 for key racial and ethnic categories. The table focuses on Fremont County, the WRIR, and the State of Wyoming. The table shows that the median age is substantially lower for Native Americans and Hispanic and Latino people than for the population as a whole, both statewide and in Fremont County and the WRIR. Correspondingly, the percentage of people aged 0 to 4 and 5 to 19 in these racial/ethnic categories is also higher than for the population as a whole. The median age of the white (European-American) population is somewhat higher than for the population as a whole, and the percent of people age 40 to 59 and 60 and over among European-Americans is greater than for the overall population.

Table 3.64. Population Age Groups by Race and Ethnicity in Select Areas, 2000

Demographic	Total Population	White (European-American)	Native American	Hispanic or Latino of any Race
Fremont County				
Percent aged 0-4	7	5	11	12
Percent aged 5-19	24	21	34	33
Percent aged 20-39	23	22	28	28
Percent aged 40-59	28	31	19	19
Percent aged 60+	18	21	8	8
Median age (year 2000)	37.7	41.2	23.0	23.3
Median age (year 2005-2007)	39.0	44.0	22.4	24.7
WRIR				
Percent aged 0-4	7	6	11	12
Percent aged 5-19	25	22	34	32
Percent aged 20-39	24	23	28	28
Percent aged 40-59	27	30	19	20
Percent aged 60+	16	20	8	7
Median age (year 2000)	35.0	40.0	22.9	23.6
Median age (year 2005-2007)	38.4	44.0	22.4	27.3
State of Wyoming				
Percent aged 0-4	6	6	10	11
Percent aged 5-19	23	23	31	30
Percent aged 20-39	26	26	30	31
Percent aged 40-59	29	29	22	20
Percent aged 60+	16	16	8	8
Median age (year 2000)	36.2	37.2	26.0	24.8
Median age (year 2005-2007)	37.3	38.7	26.4	26.7
Sources: U.S. Census Bureau 2000a; U.S. Census Bureau 2008a				
Note: All data are for 2000 unless otherwise noted.				

Housing

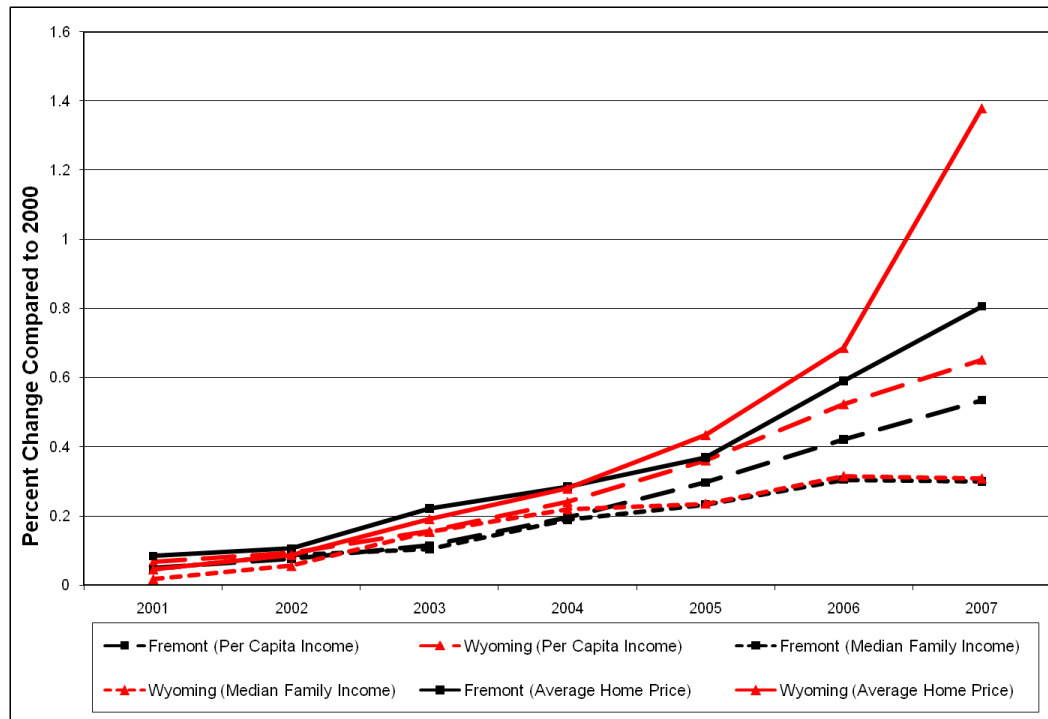
Because boom and bust cycles can impact the demand for housing, it is important to know the supply of housing in the study area. Table 3.65, “Population and Housing Units Over Time in the Study Area” (p. 531) shows the number of housing units over time in the study area. From 2000 to 2008, the number of housing units in all five counties has increased only slightly (by 8 percent in Sweetwater County, 6 percent in Natrona County, 1 percent in Hot Springs County, and 4 percent in the remaining counties). As the table shows, the growth in housing units has been generally consistent compared to the changes in population in each county.

Table 3.65. Population and Housing Units Over Time in the Study Area

Measure	2008 (number)	Percent Change Since 2000					
		2003	2004	2005	2006	2007	2008
Fremont (Population)	38,113	0	0	1	3	5	6
Fremont (Housing Units)	16,234	2	3	4	4	4	4
Carbon (Population)	15,624	-3	-3	-4	-4	-1	0

Measure	2008 (number)	Percent Change Since 2000					
		2003	2004	2005	2006	2007	2008
Carbon (Housing Units)	8,619	1	1	2	2	3	4
Hot Springs (Population)	4,622	-6	-7	-8	-7	-7	-5
Hot Springs (Housing Units)	2,573	1	1	1	1	1	1
Natrona (Population)	73,129	2	3	4	6	8	10
Natrona (Housing Units)	31,767	1	2	3	4	5	6
Sweetwater (Population)	39,944	-3	-2	-1	1	5	6
Sweetwater (Housing Units)	17,153	1	1	2	4	5	8
Source: Wyoming Economic Analysis Division 2009d							

Housing costs have also increased in recent years. Figure 3.21, “Change in Median Family Income and Average Home Price since 2001 in Fremont County and Wyoming” (p. 532) shows how median family income, per capita income, and average home sales price have changed since 2001 for Fremont County and Wyoming. Increases in the average home sales price have generally outpaced increases in per capita and family income in Fremont County and in Wyoming. This observation is especially true in recent years. For example, from 2001 to 2007 median family income and per capita income increased 30 percent and 54 percent in Fremont County, respectively, while the average home sales price increased 81 percent.



Source: Wyoming Housing Database Partnership 2009

Note: All percent changes are based on nominal income and price because the intent of the figure is to show how income has changed in relation to one element of the cost of living (housing for purchase).

Figure 3.21. Change in Median Family Income and Average Home Price since 2001 in Fremont County and Wyoming

This figure above underscores how growth in average home prices has generally outpaced growth in income. However, note that per capita income has grown at a faster rate than median family income and, in some cases, comparably to average home sales prices. Similar to home prices, monthly rents have generally increased faster than median family income in some places in the study area. Table 3.66, “Monthly Rent and Median Family Income in 2008 and Change from 2000” (p. 534) lists monthly rents in 2008 and changes since 2000, and for comparison, changes in median family income for the same period. Median family income increased from 2000 to 2008, but rents also increased in all areas. Apartment rents increased faster than median family income, and in all areas except Hot Springs, house rents increased substantially faster than median family income. Rent for mobile homes generally increased more than median family income or increased at the same pace except for Fremont County where mobile home rents increased slightly slower than median family income and in Hot Springs County where mobile home rents have remained constant since 2000.

Rent for mobile home lots grew faster, or at the same pace, compared to median family income for all counties with data (there is no available 2008 data for Hot Springs County). The area experiencing the greatest rise in rents in relation to median income was Carbon County, followed by Sweetwater County and Natrona County. While rents in Fremont County outpaced median family income, the increase was less than surrounding counties (except Hot Springs County) compared to the state as a whole.

Table 3.66. Monthly Rent and Median Family Income in 2008 and Change from 2000

Area ⁵	Median Family Income		Apartment Rent ¹		House Rent ²		Mobile Home Rent ³		Mobile Home Lot Rent ⁴	
	2008 (\$)	Percent Change From 2000	2008 (\$)	Percent Change From 2000	2008 (\$)	Percent Change From 2000	2008 (\$)	Percent Change From 2000	2008 (\$)	Percent Change From 2000
Fremont	49,700	+34.3	524	+46.8	675	+47.1	190	+27.5	577	+78.1
Carbon	55,600	+24.1	706	+107.6	900	+107.4	298	+170.9	691	+155.0
Hot Springs	51,600	+31.6	401	+37.3	492	+33.0	150	0.0	N/A	
Natrona	60,700	+37.6	702	+95.0	1088	+108.0	229	+51.7	548	+42.0
Sweetwater	71,300	+22.9	779	+112.3	1113	+130.0	294	+49.2	749	+92.1
Wyoming	60,400	+35.1	645	+68.0	931	+70.8	254	+50.3	592	+47.6

Sources: Wyoming Housing Database Partnership 2009; Wyoming Economic Analysis Division 2009e (rental costs for 2008); Wyoming Economic Analysis Division 2000 (rental costs for 2000)

N/A Not disclosed due to limited observations.

¹ Two bedroom, unfurnished unit; excludes gas and electric.

² Two or three bedroom single family house; excludes gas and electric.

³ Single-wide mobile home lot, including water.

⁴ Total monthly rental expense, including lot rent.

⁵ Rents are based on a sample in communities that meet certain population thresholds. Carbon County is based on Rawlins; Fremont County is based on Lander and Riverton; Hot Springs County is based on Thermopolis; Natrona County is based on Casper; and Sweetwater County is based on Green River and Rock Springs. Data for Wyoming as a whole is based on 28 communities across the state, including the largest community in each county and other communities with a population of more than 5,000 or a population of at least 85 percent of the county's largest city or town.

Table 3.67, "Rental Vacancy Rates Over Time in the Study Area (Percent)" (p. 534) lists rental vacancy rates by county in the study area. The Wyoming Housing Database Partnership (2009) reported on a survey of rental vacancy rates by county. Across all counties, the vacancy rates have generally decreased over the seven years reviewed. In general, the vacancy rates in 2008 were especially low. Carbon, Fremont, and Natrona Counties all had vacancy rates between 1 and 2 percent; Sweetwater County had a vacancy rate slightly above 1 percent. Carbon and Hot Springs Counties had the highest vacancy rates in 2008, with levels higher than those seen since 2002-2003 in both counties. Based on the data, there does not appear to be a clear seasonal variation of vacancy rates in any of the counties. Because the data are based on a sample, it is not certain whether these rates represent a trend toward lower rental vacancy rates or sampling error. It is important to note that the table lists only rental vacancy rates. Comprehensive vacancy data (including properties for sale) from the 2000 Census indicate that vacancy rates in Carbon, Fremont, Hot Springs, Natrona, and Sweetwater Counties were 26, 13, 17, 10, and 11 percent, respectively (U.S. Census Bureau 2000b).

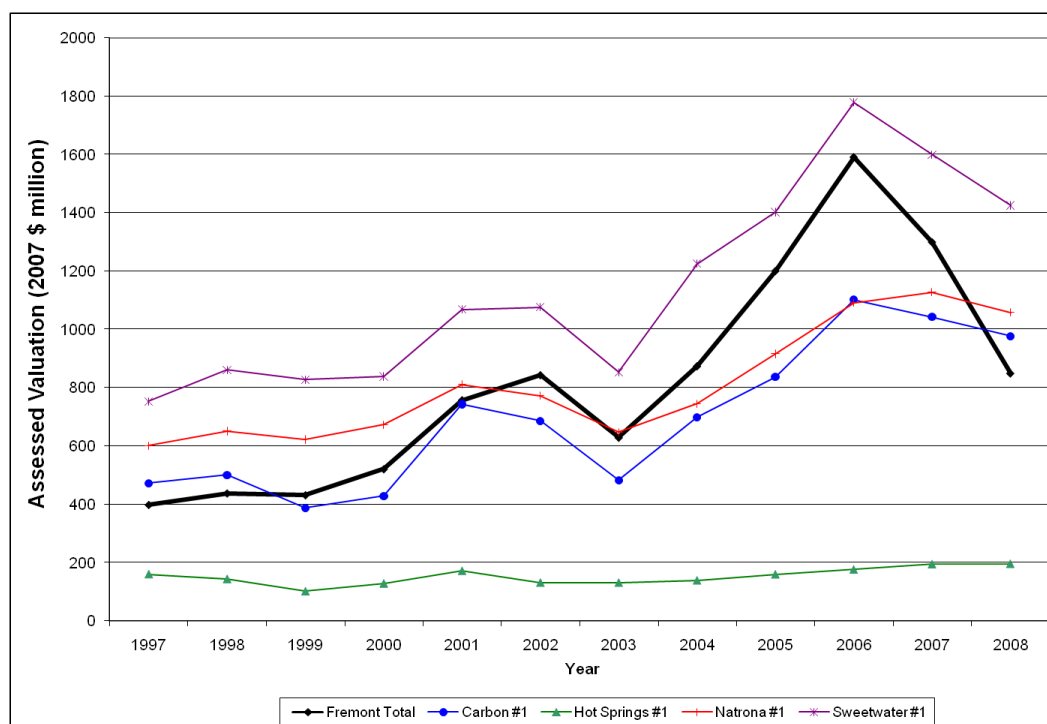
Table 3.67. Rental Vacancy Rates Over Time in the Study Area (Percent)

Year	Fremont		Carbon		Hot Springs		Natrona		Sweetwater	
	June/July	December	June/July	December	June/July	December	June/July	December	June/July	December
2001	6.6	5.4	5.7	16.1	5.4	6.4	2.5	1.9	8.2	4.5
2002	16.1	8.5	15.0	9.6	11.0	11.7	3.6	4.5	6.1	4.5
2003	3.5	5.7	11.9	11.0	10.6	9.9	2.7	3.4	2.1	0.9

Year	Fremont		Carbon		Hot Springs		Natrona		Sweetwater	
	June/ July	Decem- ber	June/ July	Decem- ber	June/ July	Decem- ber	June/ July	Decem- ber	June/ July	Decem- ber
2004	4.6	2.9	8.4	14.5	6.8	4.7	2.6	2.8	0.9	1.6
2005	1.2	1.9	7.6	3.7	8.3	6.8	2.7	2.0	2.4	2.4
2006	2.5	1.4	2.4	1.0	4.4	8.5	1.6	1.7	1.9	0.6
2007	0.8	1.4	0.8	2.0	5.4	5.3	0.6	1.1	1.2	0.1
2008	1.6	1.9	1.6	10.8	9.3	5.9	1.1	1.0	1.2	1.6

Source: Wyoming Housing Database Partnership 2009

Figure 3.22, “Assessed Property Valuation Trends by County, 1997-2008” (p. 535) shows recent trends in assessed property valuation by county, based on inflation-adjusted 2008 dollars. Assessed property valuation in Hot Springs County has remained relatively constant, with a slight increase in recent years, but well below the valuation in the other four counties. The trends in assessed property valuation in Fremont, Carbon, Natrona, and Sweetwater Counties are similar. Assessed property valuation for these school districts experienced a sharp decrease between 2002 and 2003, followed by a steady and substantial increase in assessed property valuation between 2003 and 2006. As shown in the figure, the trend at the state level is consistent with the trend observed in these four counties. Overall, assessed property valuation increased substantially between 1997 and 2006 in these four counties and in the state as a whole (Wyoming Department of Education 2008a). This substantial increase was followed by a steep decrease between 2006 and 2008, particularly in Fremont and Sweetwater Counties.



Source: Wyoming Department of Education 2008a

Note: Adjusted for inflation (to 2008 dollars) using the Wyoming Cost of Living Index for central Wyoming (Wyoming Economic Analysis Division 2009e).

Figure 3.22. Assessed Property Valuation Trends by County, 1997-2008

Customs, Culture, and Social Trends

State and federal agencies administer approximately 58 percent of the land in Fremont County. The Lander Field Office administers relatively small portions of Hot Springs, Carbon, Natrona, and Sweetwater Counties, although other BLM field offices administer lands in these counties. The BLM also administers federal mineral estate in all five counties. Therefore, BLM management decisions can impact social conditions in all five counties. However, regarding social conditions related to ranching on public lands, for which surface ownership is the primary consideration, management decisions in this document have more potential to impact conditions in Fremont County than Carbon, Hot Springs, Natrona, and Sweetwater Counties (Fremont County accounts for the most BLM-administered surface area in the planning area).

Land use, resource development, community values, and economic development are closely intertwined, and BLM land and resource management decisions can impact social and economic conditions for all of the communities in the study area. Community values regarding land and resource management are central to social issues in the study area because they are closely tied to issues of economic development, customs and culture, and quality of life. Understanding the development, culture, and history of the area provides valuable insight into how changes in the study area might impact the livelihood and quality of life of residents.

Before European settlement, the Eastern Shoshone inhabited the planning area. The Eastern Shoshone were confined to the original boundaries of the WRIR in 1863. In 1877, the surviving members of the Northern Arapaho tribe were placed on the WRIR, and in 1878, the original 44 million-acre reservation was reduced to approximately 2.3 million acres (Massey 2004). In 1906, WRIR tribal representatives ceded reservation lands north and west of the “big bend of the Wind River” to the U.S. government. This cessation led to the opening of these lands to European-American settlement under the Homestead Act, the establishment of nonnative owned farming areas near the big bend of the Wind River, and founding of the town of Riverton (Riverton Museum 2007).

Historically, economic development in the study area has been based on resource extraction and tourism. Agriculture, particularly sheep and cattle ranching, has contributed to the economy and the social fabric of communities since the first nonnative settlement. Sugar beet production also contributed to development historically, but there is little sugar beet production in the planning area today. Tourism has historically represented an important economic generator, primarily in Dubois and Lander. Timber played an important role in development in Fremont County from the 1910s through the 1940s. Oil and gas development and minerals mining also played a role, with uranium from 1953 to the 1980s constituting the primary mineral “boom.”

Oil was discovered near Riverton in approximately 1918. Since that time, there has always been some oil and gas development, but historically, uranium contributed more to mineral development in the area. The discovery of uranium in the Gas Hills near Riverton in 1953 brought a new boom to the Riverton area. According to the Riverton Museum, the uranium industry transformed Riverton from a quiet farming community of 2,500 people into a bustling commercial center of more than 10,000 (Riverton Museum 2007). Although market forces brought dramatic cutbacks in area mining during the 1980s (most of the area is now being reclaimed), during the uranium boom Riverton became the largest community in west-central Wyoming. Riverton continues to have a relatively diversified commercial economy and attracts people from a wide area. Lands outside the planning area, but in the five-county study area, also represent important areas for mining and mineral development. For example, Sweetwater County is the only county in the state that produces trona (soda ash), which is used in glassmaking and other industries.

Beginning in 1914, railroad ties in the forests north and west of Dubois were cut and floated down the Wind River to Riverton, where they were delivered to the Chicago and North Western Railroad (see cultural resources discussion of the Warm Springs Flume). This operation was one of the principal suppliers of ties for the Chicago and North Western Railroad until the late 1940s. Many of the tie hacks were Scandinavian immigrants, some descendants whom still live in the area.

As early as the 1920s, Lander was known as “where the rails end and the trails begin,” a reference to the freight and passenger rail service that extended from Casper to Lander in 1906 as part of the Wyoming and Northwestern Railway Company. The rail service never extended west of Fremont County, but the line to Lander contributed to the development of the towns of Riverton, Hudson, and Shoshoni, all of which had depots. In the early 20th Century, commercial bus service provided access from Lander to Yellowstone National Park. Lander also provided recreational opportunities in its own right. Tourists would frequently visit dude ranches in Dubois, with the height of the dude ranch activity coming in the 1930s and 1940s (Jost 2007).

Agriculture has contributed to the local economy since the domestic livestock industry began in the 1860s and 1870s. Around the turn of the century, the open range sheep industry was more substantial than the cattle industry (Jost 2007). Today, there are still large numbers of both cattle and sheep grazed in the planning area, a portion of which rely on public lands grazing. The development of irrigation water supplies increased in the 1920s when the U.S. Bureau of Reclamation took over the big bend of the Wind River area that had been opened for European-American settlement, and helped to speed up agricultural development. Irrigated crop farming is most prominent near Pavillion and Riverton and, to a lesser extent, in Lander (Jost 2007).

Although ranching today makes a relatively small contribution to the economy in the study area, it is an important part of its culture and history. Historically, and today, ranching has provided direct and indirect employment; maintenance of scenic vistas; stewardship of remote, privately owned lands; wildlife habitat; and the continuation of a way of life that helps draw tourists to the state. However, livestock grazing has its critics. Improper livestock grazing management has degraded the health of some public lands. As a result, there is an ongoing dialog between the BLM and some of the livestock operators focusing on stocking levels and seasons of use. At present, approximately 97 percent of the planning area is available for livestock grazing under 310 permits; some permittees have multiple permits. Increasingly, these permits are held by out-of-state owners with no historic ties to the community.

With mounting economic pressures on the livestock sector, some ranch owners have raised money for their retirement by subdividing portions of their land into “ranchettes” that are then sold to individuals, often “amenity retirees” who chose the area for its open spaces, recreational opportunities, and other lifestyle aspects. The sale of these ranchettes provides liquidity to ranchers who frequently have most of their assets in land. This trend is reflected in both the increase in value of farm land and the decrease in farmed acres, as discussed below.

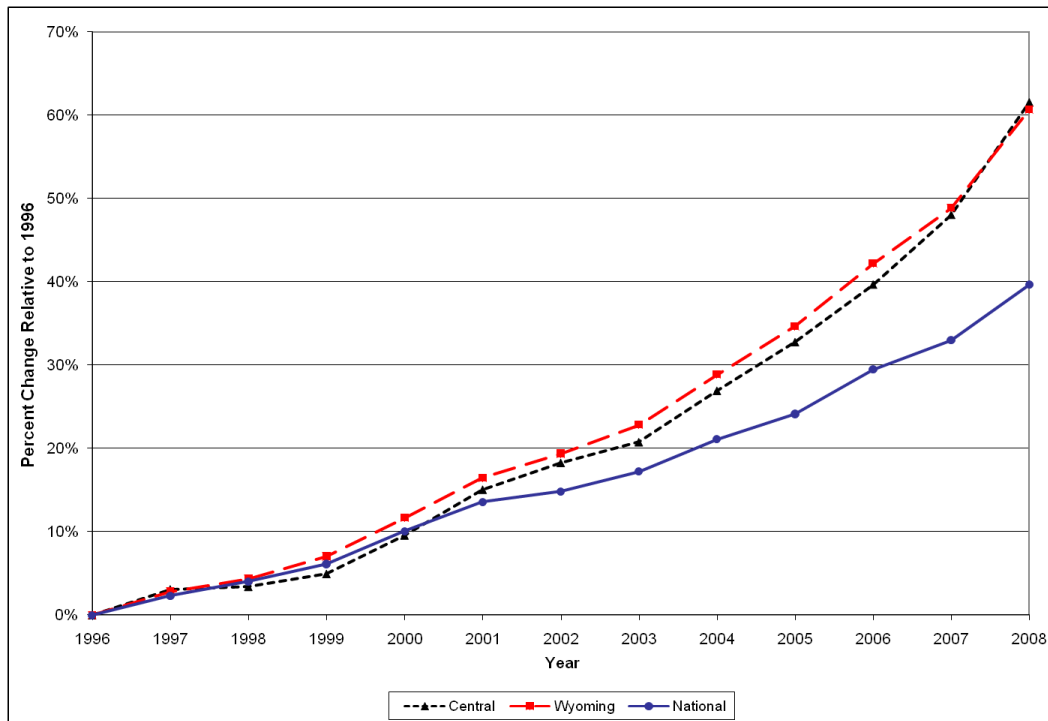
Because of these sales, there are often more fences and road development on private lands, which can adversely impact open views near developed communities, wildlife habitat, and rangeland health amenities valued by many residents, including many of those who live on ranchettes. This trend is important because of the potential for BLM-authorized actions to affect the profitability of ranching that depends on public lands grazing and thereby increase the trend of subdividing lands that have been traditionally part of livestock operations. The development of ranchettes on the hills around Lander is entirely on privately owned and mostly subdivided ranches.

The availability of a wide spectrum of recreational opportunities on public lands is another important component of many lifestyles and communities. Many towns in the planning area continue to serve as “gateway cities” for recreational activities in Yellowstone and Teton National Parks, and have become recreation destinations in their own right. Because recreation involves diverse groups with activities that are sometimes competing, changes in management of public lands can impact the various recreational sectors and interests differently.

The land itself has influenced the social fabric of the communities. The land has provided hunting and fishing opportunities for people from the Native American inhabitants before European settlement to today’s residents. It also has provided job opportunities related to tourism. Tourists travel to the area to enjoy scenic vistas and historic places that appeal not only to non-local travelers but also permanent residents. In addition to tourism, the *Economic Conditions* section provides information on the contributions of mining and other sectors to current employment, earnings, and tax revenues.

One factor that affects the customs, culture, and social trends in communities is the cost of living. The Wyoming Economic Analysis Division calculates relative changes in cost of living over time by estimating the cost of a set of goods and services that represents the average consumer’s purchases for housing, food, health care, travel costs, and other items. If the cost of living for a particular area increases faster than average income, that could mean that long-time residents, especially those on fixed incomes, find their lifestyle less affordable over time. Over the long term, a higher cost of living might encourage people to relocate from a community and discourage migration into the community because households would not seek to relocate where there are no employment opportunities.

The Wyoming Economic Analysis Division calculates changes in the cost of living over time for a three-county region (Converse, Fremont, and Natrona Counties) in central Wyoming (Wyoming Economic Analysis Division 2009e). Figure 3.23, “Cost of Living Changes in Central Wyoming, Wyoming and the Nation, 1996-2008” (p. 538) shows how the cost of living in central Wyoming has changed in relation to the cost of living for the entire state and in the United States. Starting in about 2000, the cost of living in the central region and Wyoming as a whole began to increase at a greater rate than the nation. However, it is important to note that the three-county region for which data are shown differs from the planning area in several ways, including the inclusion of Converse County and all of Natrona County, and excluding Carbon, Hot Springs, and Sweetwater Counties. Therefore, it is possible that trends observed in the central region deviate slightly from the actual trends in the planning area.



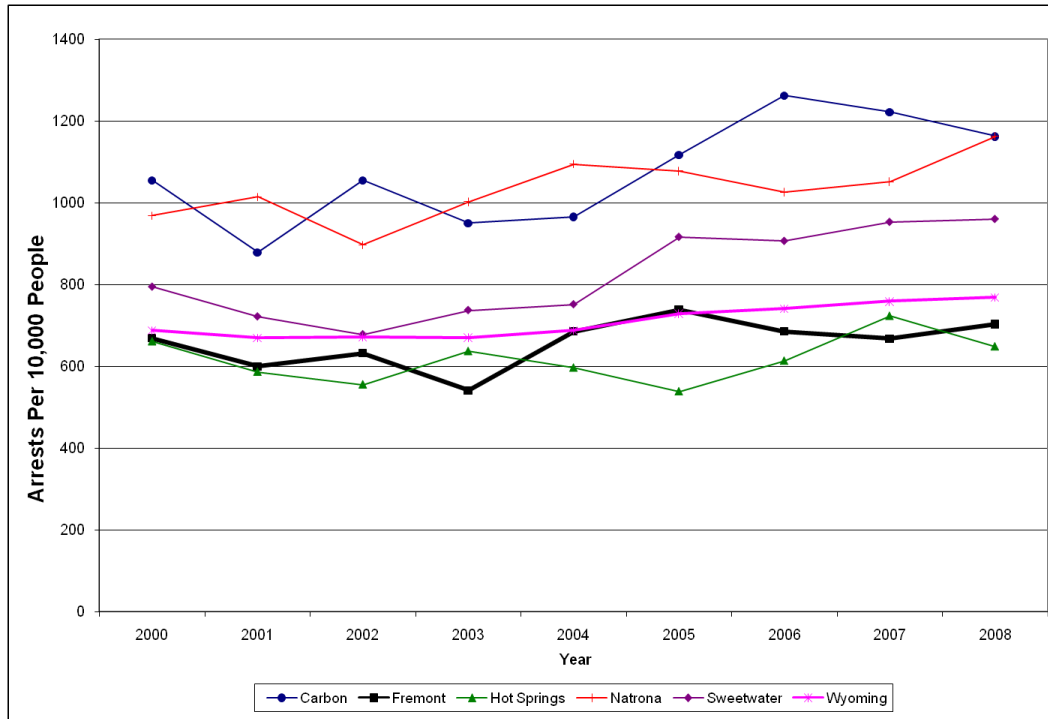
Source: Wyoming Economic Analysis Division 2009e

Figure 3.23. Cost of Living Changes in Central Wyoming, Wyoming and the Nation, 1996-2008

Public Safety

This section describes recent trends in crime rates and vehicle traffic, both of which BLM management decisions could affect. Figure 3.24, “Arrests per 10,000 Persons in the Study Area, 2000-2008” (p. 539) shows arrests per 10,000 people for each of the counties in the study area and for the state. Since 1999, the crime rate in Wyoming has increased somewhat and currently stands at almost 800 arrests per 10,000 people. Over the same period, the rate in Fremont County has been below or approximately equal to that for Wyoming. The crime rates in Carbon, Natrona, and Sweetwater Counties have been consistently higher than in Wyoming, and especially higher in Carbon and Natrona Counties. The crime rate in Carbon County increased from 2002 through 2006, but has decreased since 2006. The crime rate in Natrona County decreased from 2004 through 2006, but has risen since 2006.

Drug-related crimes, including sale, manufacture, and possession of controlled substances, increased substantially since 2000 in all five counties, more than doubling in Sweetwater and Hot Springs Counties, and outpaced population growth substantially (BLM 2009a). In the study area in general, the largest increase in drug-related crimes occurred between 2000 and 2004 and then either stabilized or decreased between 2004 and 2005. Sweetwater County experienced increases through 2005, and Hot Springs County observed a spike in drug-related crimes between 2005 and 2006. All five counties saw decreases in index crimes (homicide, rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft) since 2000. Driving under the influence increased between 2000 and 2006 in all five counties. In Fremont County, driving under the influence increased approximately 40 percent compared to the state average increase of approximately 18 percent.



Sources: Wyoming Division of Criminal Investigation 2001; Wyoming Division of Criminal Investigation 2002; Wyoming Division of Criminal Investigation 2003; Wyoming Division of Criminal Investigation 2004; Wyoming Division of Criminal Investigation 2005; Wyoming Division of Criminal Investigation 2006; Wyoming Division of Criminal Investigation 2007; Wyoming Division of Criminal Investigation 2008; Wyoming Division of Criminal Investigation 2009

Figure 3.24. Arrests per 10,000 Persons in the Study Area, 2000-2008

Vehicular traffic in all five counties has increased over the last 10 years (BLM 2009a). Specifically, vehicle miles traveled increased 23 percent, 22 percent, 3 percent, 26 percent, and 28 percent in Fremont, Carbon, Hot Springs, Natrona, and Sweetwater Counties, respectively, between 1997 and 2006. Over the same 10 years, population increased approximately 4 percent in Fremont County, 6 percent in Natrona County, stayed virtually constant in Sweetwater County, and decreased 4 percent and 8 percent in Carbon and Hot Springs Counties, respectively. At the state level, vehicle miles traveled increased 24 percent between 1997 and 2006 (from 14.1 million miles to 17.5 million miles), whereas the population increased only 5.2 percent over the same period.

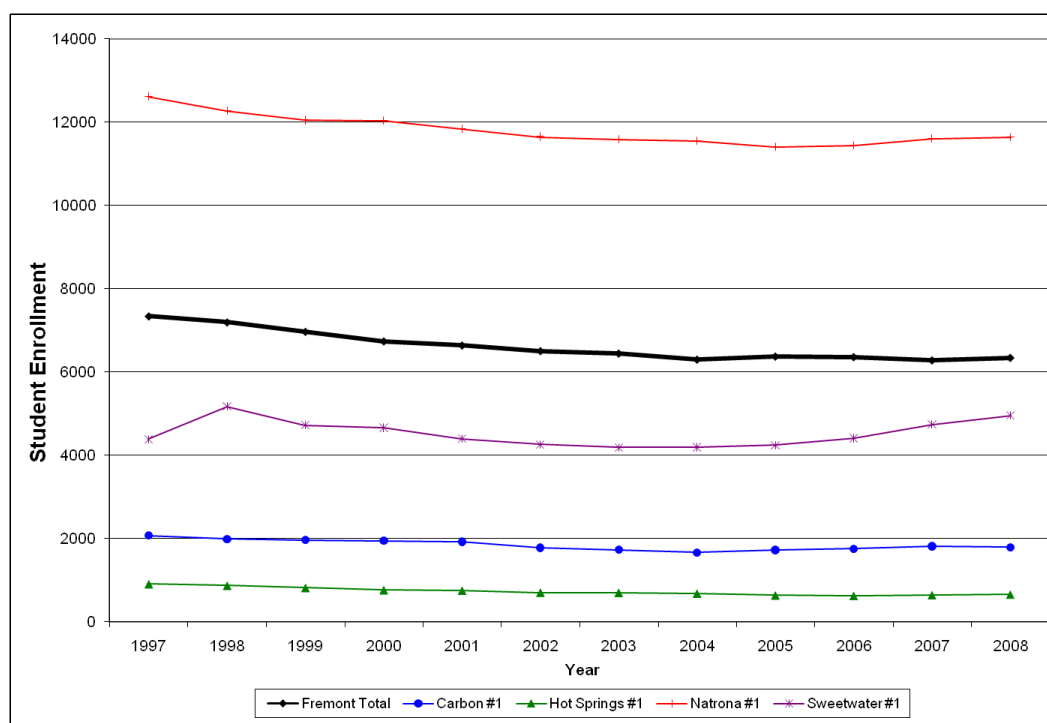
With the exception of Sweetwater County, compared to the increase in vehicle miles traveled described above, the number of vehicle crashes has either declined or increased by a smaller margin in the last 10 years (BLM 2009a). Specifically, the number of crashes dropped 10 percent in Fremont County, 3 percent in Carbon County, and 30 percent in Hot Springs County, and increased only 4 percent in Natrona County. In Sweetwater County, both vehicle miles traveled and the number of crashes increased 28 percent. At the state level, the number of crashes increased only 2 percent between 1997 and 2006 (16,663 to 17,429 crashes) compared to a 24-percent increase in vehicle miles traveled.

Educational Services

BLM management of public lands has the potential to directly affect many of the economic sectors in the study area, and local tax revenues are correspondingly affected; in turn, this affects

local services funded by those revenues. However, in the case of school districts, funding is a function of what is defined as “local resources” and “entitlements.” In general, Wyoming school districts have a “guarantee” regarding funding. The guaranteed level of district funding is a function of the number of students and the number of schools in the district. If the local resources exceed entitlements, the excess is “recaptured” and made available to other school districts throughout the state. Conversely, if local resources are less than the guarantee, that difference is made up from entitlements. Therefore, while local revenues do not directly affect education funding because of the Recapture component, changes in local tax revenues do affect education funding from a statewide perspective.

Figure 3.25, “School Enrollment Trends by County, 1997-2008” (p. 541) shows historical school enrollment trends by county based on data from the Wyoming Department of Education (Wyoming Department of Education 2008b). Consistent with trends for the school-age population previously shown, Figure 3.25, “School Enrollment Trends by County, 1997-2008” (p. 541) shows the school enrollment level in 2008 has declined from enrollment levels in 2000 for all counties besides Sweetwater. However, school enrollment levels remained the same or increased slightly starting in 2003 or 2004. Enrollment decreased steadily at the state level between 1997 and 2005 and increased slightly between 2006 and 2008.



Source: Wyoming Department of Education 2008b

Note: Enrollment figures are measured on October 1 of each year.

Figure 3.25. School Enrollment Trends by County, 1997-2008

Because people have different values regarding changes in demographics and communities, residents might have different opinions and values regarding the decline in school enrollment and property evaluations. Part of the BLM mission is to work with local governments to ensure that its management decisions support local goals and plans, community values, and the needs of residents, and to address regional and national issues.

3.8.2. Economic Conditions

Economic conditions relate to the analyses of production, distribution, and consumption of goods and services. Economic conditions describe how individuals and communities participate in the exchange of goods and services by earning a living and consuming products and services they need and want. The BLM has the capacity, through its decision-making responsibilities, to manage resource development in the planning area and influence the economy of the wider region. As for social conditions, the study area for economic conditions is all of Carbon, Fremont, Hot Springs, Natrona, and Sweetwater Counties. This section summarizes demographic and economic information, including trends and existing conditions. It also identifies and describes major economic sectors in the study area that BLM management actions could affect.

Economic Activity and Output

Industries most affected by BLM land management policies and programs in the study area are mining (including oil and gas exploration and development), tourism and recreation, and agricultural production. BLM policies and programs also affect, in a somewhat more limited fashion, logging and the harvest of forest. However, in recent years, there has been a limited amount of commercial cutting in forested areas in the study area. The focus of the local timber market is on local demand for various wood products, including house logs, character wood, and fencing material (BLM 2009a).

Mining and Mineral Production

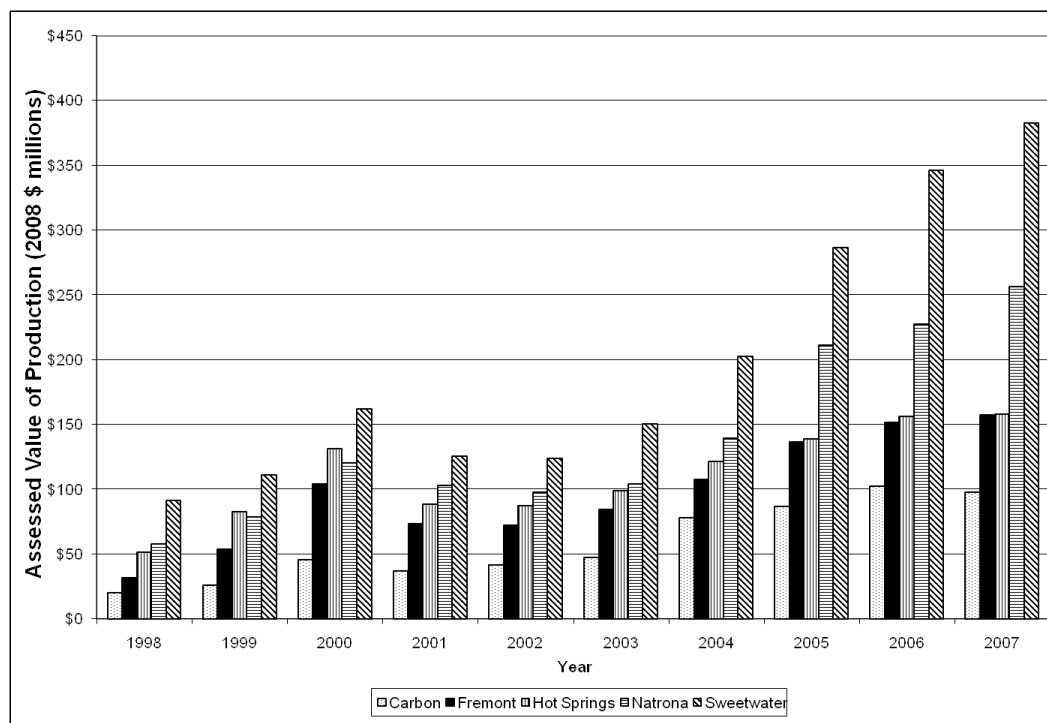
Mining and mineral production, including oil and gas exploration and development, constitutes a substantial economic activity in the study area. Table 3.68, “Estimated Mineral Production Value by County in the Study Area, Production Year 2007” (p. 542) summarizes the quantity and value of mineral production in the counties in the study area and the State of Wyoming. Economically, the largest contributors to mining activity in all five counties are oil and gas exploration and development, most substantially in Sweetwater and Fremont Counties. There is also substantial coal and trona mining in Sweetwater County, but it occurs entirely outside of the planning area. The *Mineral Resources* section of this document provides additional information about mineral resources produced in the planning area.

Table 3.68. Estimated Mineral Production Value by County in the Study Area, Production Year 2007

Mineral	Carbon	Fremont	Hot Springs	Natrona	Sweetwater	Wyoming
Production or Sales (units)						
Oil (bbls sold)	1,462,699	3,132,380	3,158,113	3,759,457	5,359,955	52,411,076
Gas (mcf sold)	103,569,986	123,122,643	243,474	27,990,886	185,169,485	2,012,866,007
Coal (tons produced)	134,207	0	443	0	10,090,002	451,963,767
Trona (tons produced)	0	0	0	0	19,660,455	19,660,455
Bentonite (tons)	0	0	2,849	72,160	0	4,031,817
Sand and Gravel (tons)	888,207	575,195	45,922	1,198,969	1,280,683	16,035,609
Uranium (lbs)	0	0	0	0	0	1,984,267
Decorative Stone (tons)	0	0	0	0	0	4,484

Mineral	Carbon	Fremont	Hot Springs	Natrona	Sweetwater	Wyoming
Taxable Valuation (\$ million)						
Oil (bbls sold)	\$90	\$144	\$145	\$235	\$351	\$2,843
Natural Gas	\$530	\$338	\$1	\$118	\$840	\$7,271
Coal (tons produced)	\$4	\$0	\$0.01	\$0	\$131	\$3,280
Trona (tons produced)	\$0	\$0	\$0	\$0	\$340	\$340
Bentonite	\$0	\$0	\$0.03	\$1	\$0	\$49
Sand and Gravel	\$2	\$1	\$0.05	\$3	\$2	\$28
Uranium	\$0	\$0	\$0	\$0	\$0	\$20
Decorative Stone	\$0	\$0	\$0	\$0	\$0	\$0.2
Source: Production and valuation are for July 1, 2007, through June 30, 2008, from Wyoming DOR 2008.						
Notes: Taxable valuation might differ from market or sales value because it excludes certain costs of production. This table includes all minerals for which the Wyoming Department of Revenue (Wyoming DOR 2008) provides data on production from the counties in the study area.						
bbl barrel						
lb pound						
mcf thousand cubic feet						

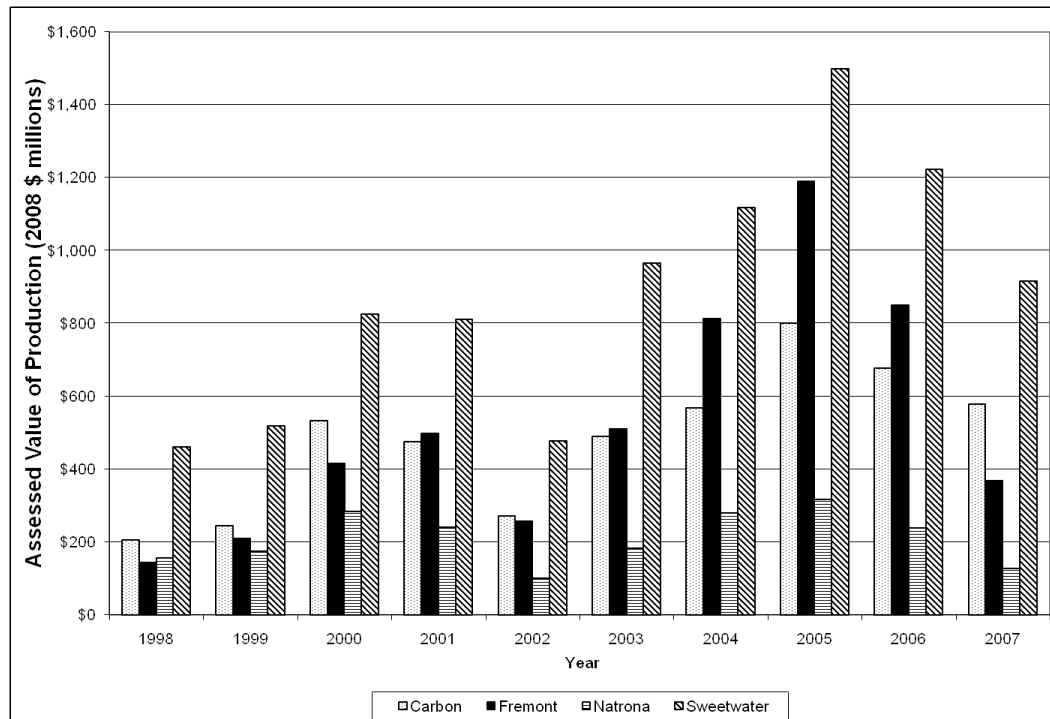
Figure 3.26, “Assessed Valuation of Oil Production by County in the Study Area, 1998-2007” (p. 543) and Figure 3.27, “Assessed Valuation of Gas Production by County in the Study Area, 1998-2007” (p. 544) show the trends in the value of oil and gas production over recent years for the study area counties. The assessed valuation in the figures is adjusted for inflation using the Wyoming Cost of Living Index for the central region (Converse, Fremont, and Natrona Counties) as defined by the Wyoming Economic Analysis Division (Wyoming Economic Analysis Division 2009e). As Figure 3.26, “Assessed Valuation of Oil Production by County in the Study Area, 1998-2007” (p. 543) shows, oil production value has generally risen since 2002, but the greatest rise has been in Fremont and Sweetwater Counties. Gas production value has also substantially risen in Carbon, Fremont, and Sweetwater Counties since 1998; however, gas production value fell in 2002 and again in 2006 for these three counties. Gas production rose moderately in Natrona County, and the small production in Hot Springs County has further decreased since 1998. Figure 3.27, “Assessed Valuation of Gas Production by County in the Study Area, 1998-2007” (p. 544) does not display the assessed valuations of gas production in Hot Springs County because the gas production valuation is approximately \$1 million or less (varies from \$0.3 to \$1.1 million over the period shown), which is so much smaller than the other counties that it does not show on the graph.



Sources: Wyoming DOR 1999; Wyoming DOR 2000; Wyoming DOR 2001a; Wyoming DOR 2002; Wyoming DOR 2003; Wyoming DOR 2004; Wyoming DOR 2005; Wyoming DOR 2006; Wyoming DOR 2007; Wyoming DOR 2008.

Note: Adjusted for inflation using Wyoming Economic Analysis Division 2009e.

Figure 3.26. Assessed Valuation of Oil Production by County in the Study Area, 1998-2007



Sources: Wyoming DOR 1999; Wyoming DOR 2000; Wyoming DOR 2001a; Wyoming DOR 2002; Wyoming DOR 2003; Wyoming DOR 2004; Wyoming DOR 2005; Wyoming DOR 2006; Wyoming DOR 2007; Wyoming DOR 2008.

Notes: Adjusted for inflation using Wyoming Economic Analysis Division 2009e

Assessed valuation of gas production in Hot Springs County is \$1 million and below for the entire time period, and therefore does not show on the graph.

Figure 3.27. Assessed Valuation of Gas Production by County in the Study Area, 1998-2007

As noted in detail in the *Locatable Minerals* section of this chapter, Fremont County has produced more than 26 million tons of uranium ore since the 1950s, but all producing mines have been closed for more than 20 years. The recent increase in the price of uranium ore has sparked renewed interest in uranium exploration in several areas. There are numerous notices, plans of operation, and two pending or expected EISs related to uranium exploration and development in the planning area. Although uranium exploration is not at a stage where it contributes to the existing employment and economic base, depending on market conditions and mineral recoverability, uranium mining could again contribute to economic conditions in the planning area.

In 1981, the Wyoming Geological Survey identified the potential for gold deposits in the Rattlesnake Hills area, and subsequent exploration has revealed a large-tonnage, low-grade deposit with the potential to host more than 1 million ounces of gold. In a December 2008 news release, one company exploring the area announced that it found a large halo of gold mineralization (BLM 2009a). In 2009, this company filed a Plan of Operations to expand its drilling program, and an EIS to support an eventual mining operation is possible in the future. Thus, like uranium, gold mining could eventually contribute some employment and economic base in the planning area. The *Locatable Minerals* section of this chapter provides additional information about gold deposits.

Wind for electric power generation is another resource in the planning area that does not currently contribute large amounts of earnings and employment but could in the future. The BLM PEIS

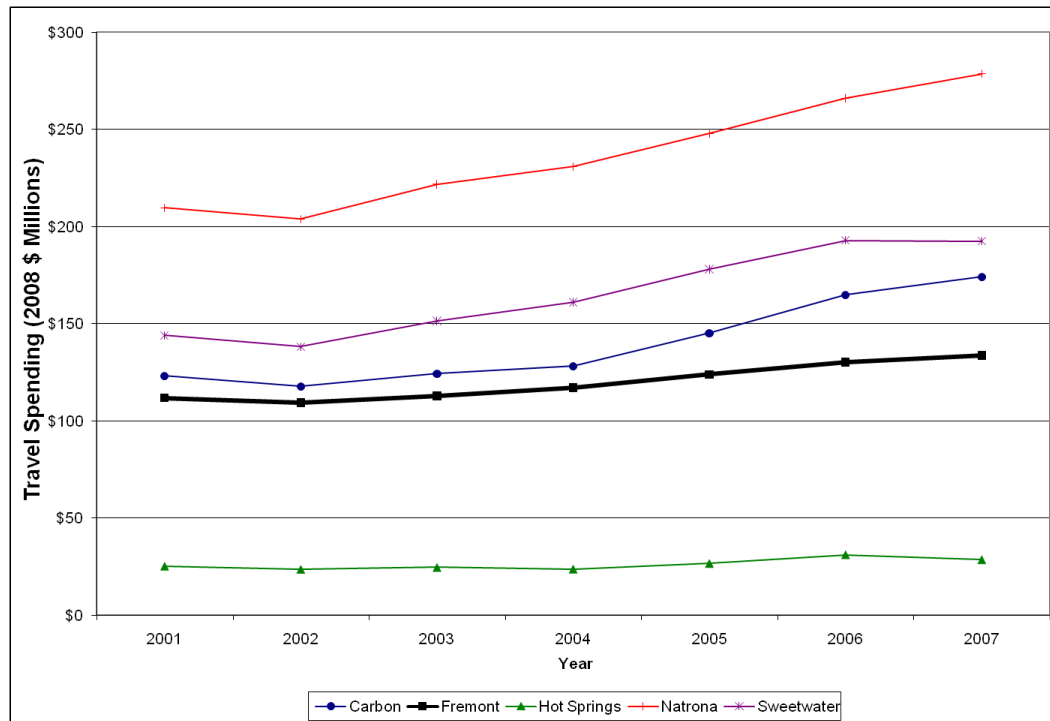
for a wind-energy development program identified Lander as a low-potential area for wind development due to the lack of transmission infrastructure. The Lander Field Office has nine ROW applications for wind site testing and monitoring, although it has no applications for full wind-energy development (BLM 2009a). Wind generated electricity is still highly speculative for most areas of Wyoming including the planning area. Located far from population centers and with limited existing transmission capacity the planning area may not be competitive enough to justify the very high capital costs associated with wind generation even without regard to resource conflicts such as greater sage-grouse habitats and Congressionally Designated Trails.

Pending federal legislation and other factors could lead to increased interest in wind-energy development solar-power development in the planning area. At present, there are several private solar projects of various sizes in the area – NOLS Rocky Mountain installation in Lander is one of the largest in the state – and there is potential for future generation. Wind- and/or solar-power generation could eventually provide employment opportunities. Refer to the *Renewable Energy* section of this chapter for additional information on the potential for renewable energy development in the planning area.

Recreation

Recreation activities also contribute to the region's economy. In 2003, the WGFD found that direct expenditures from hunting, fishing, and wildlife watching in the counties in the study area totaled \$26.6 million (WGFD 2003). About \$10.3 million of these expenditures were attributable to activities on BLM-administered surface area in the planning area (WGFD 2003). Direct expenditures include visitor spending on lodging, food and groceries, gasoline, motor vehicle repairs and service, outfitters and guides, access fees, entertainment, souvenirs, equipment, and other categories.

The WGFD has not performed a more recent survey of expenditures from hunting, fishing, and wildlife watching for the planning area (Stewart 2008). However, trend data for 2001 through 2007 (Figure 3.28, "Travel and Tourism Spending in the Study Area, 2001-2007" (p. 546)) shows that, generally, travel and tourism spending (including recreation and other travel-related spending), adjusted for inflation, has recently increased in all five counties. The figure shows that inflation-adjusted spending remained the same or decreased between 2001 and 2002 and has increased steadily since 2002. Between 2006 and 2007, inflation-adjusted spending increased slightly or remained about the same for all of the counties in the study area.



Source: Dean Runyan Associates 2008

Note: Adjusted for inflation using Wyoming Economic Analysis Division 2009e.

Figure 3.28. Travel and Tourism Spending in the Study Area, 2001-2007

Note that travel and tourism spending includes all travel to the counties, except for commuting and other routine travel; therefore, trips for non-recreational purposes also are included. The Wyoming State Office of Travel and Tourism reported that more than 90 percent of all trips to Wyoming were for pleasure; this percentage could differ for specific counties (WTT 2007).

When discussing the economic contribution of recreational activities, it is noteworthy that one of the largest permitted outfitters in the United States, **NOLS**, has its international headquarters in Lander. **NOLS** provides wilderness based education in technical outdoor skills, leadership, and environmental studies. It employs approximately 100 full-time and 40 seasonal employees in Wyoming, its students contribute an estimated \$1.1 million in annual retail sales in Lander, and it comprises 20 percent of the commercial air travel through the Riverton Airport (NOLS 2006). The continued operation of the local recreation-based portion of **NOLS's** activities, including the contribution of its students, is predicated on the continued management of the BLM and USFS managed lands in and surrounding the planning area in a manner that is conducive to wilderness based and remote activities.

Similarly, the Wyoming Catholic College is planning the development of a “green campus” on private lands adjoining BLM-managed lands in the South Pass-Red Canyon area. The goal of the college is to integrate the campus and its students into the remote and undeveloped lands. These lands are currently protected by ACEC designation that limits surface-disturbing activities.

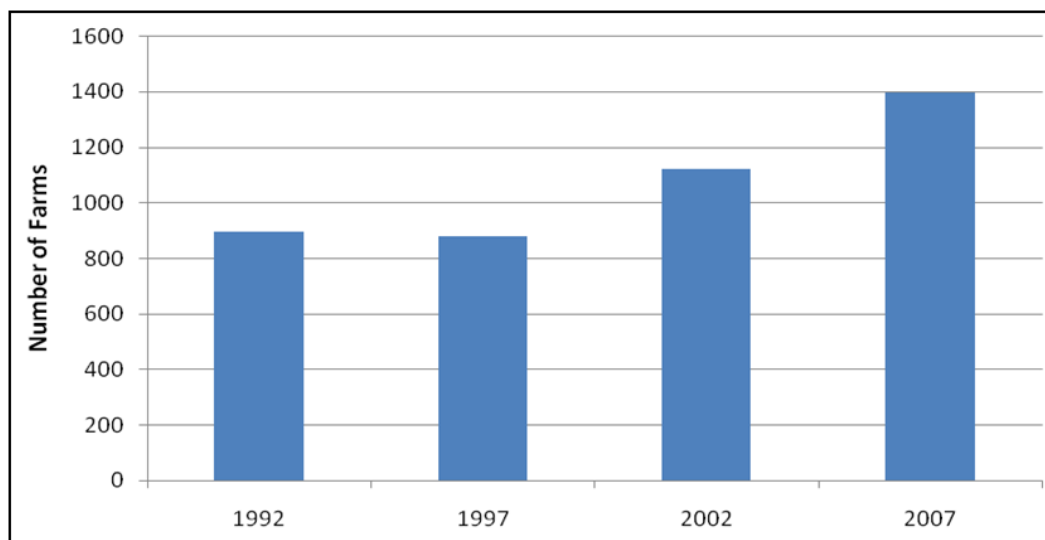
Livestock Grazing

There are 310 grazing allotments covering 2,352,458 acres of BLM-administered surface with approximately 279,000 AUMs. While cattle use most of the AUMs, sheep and horses also graze on BLM-administered lands.

BLM-administered lands are important to local ranch operations using allotments in all five counties, particularly Fremont County. On average, the BLM leases grazing allotments at lower fees than state or private lands. Federal (BLM) grazing fees in Wyoming were \$1.56 per AUM in 2006, and \$1.35 per AUM in 2007 and 2008 (BLM and USFS 2007, BLM and USFS 2009). For comparison, grazing fees on state land were \$4.78 per AUM in 2006, \$5.17 per AUM in 2007, and \$5.21 in 2008 (Pannell 2008). The average grazing rate on privately owned non-irrigated land in Wyoming was \$15.10 per AUM in 2006, \$15.40 in 2007, and \$15.70 in 2008 (Shepler 2008, NASS 2009).

However, the lower lease fees correspond to potentially greater use restrictions and responsibilities for the lessee. Federal grazing leases typically restrict the number and species of animals that may be grazed; on private leases, there is normally no penalty for grazing more animals other than potential nonrenewal of the lease. Federal leases tend to be less flexible than private leases regarding turnout and roundup dates. There are differences in terms of construction and maintenance of rangeland improvements, although a perfect comparison is not possible because there are different specifications that vary for private leases. On federal leases, construction of improvements can be accomplished in a variety of ways, and expenses other than materials might be the responsibility of the lessee, who is generally responsible for maintaining the improvements. On private leases, the landowner typically bears a substantial part of the cost of major range improvements and typically pays for revegetation (USFS and BLM 1992).

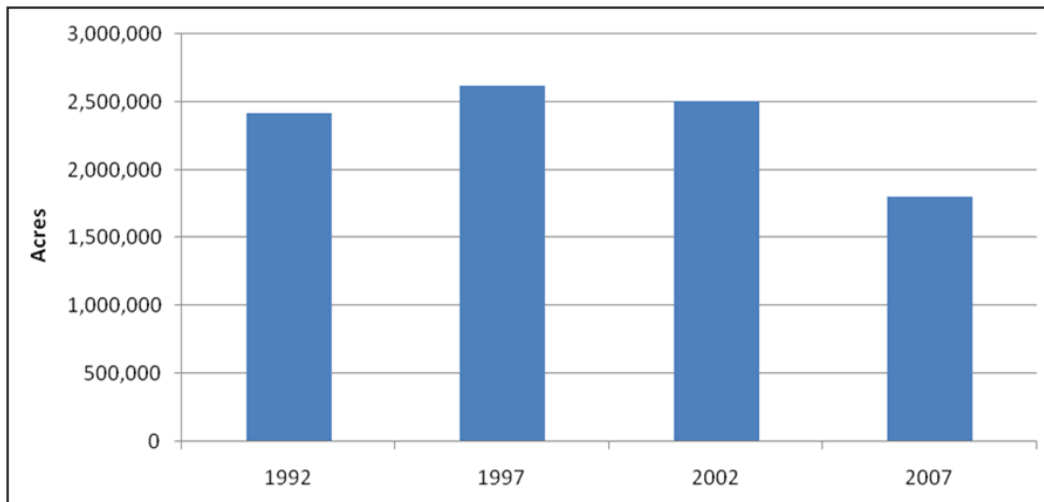
Although statewide the number of farms has remained constant, in Fremont County the number of farms has increased while the total acreage devoted to agriculture decreased. Figure 3.29, “Total Number of Farms in Fremont County, 1992-2007” (p. 548) shows the total number of farms in Fremont County from 1992 to 2007 (USDA - NASS 2009). The number of farms includes all farms and not just those utilizing public lands for livestock grazing.



Source: USDA - NASS 2009

Figure 3.29. Total Number of Farms in Fremont County, 1992-2007

Figure 3.30, “Total Farm Acres in Fremont County, 1992-2007” (p. 549) shows the total number of acres (private, state, and federal) used for farming in Fremont County from 1992 to 2007.

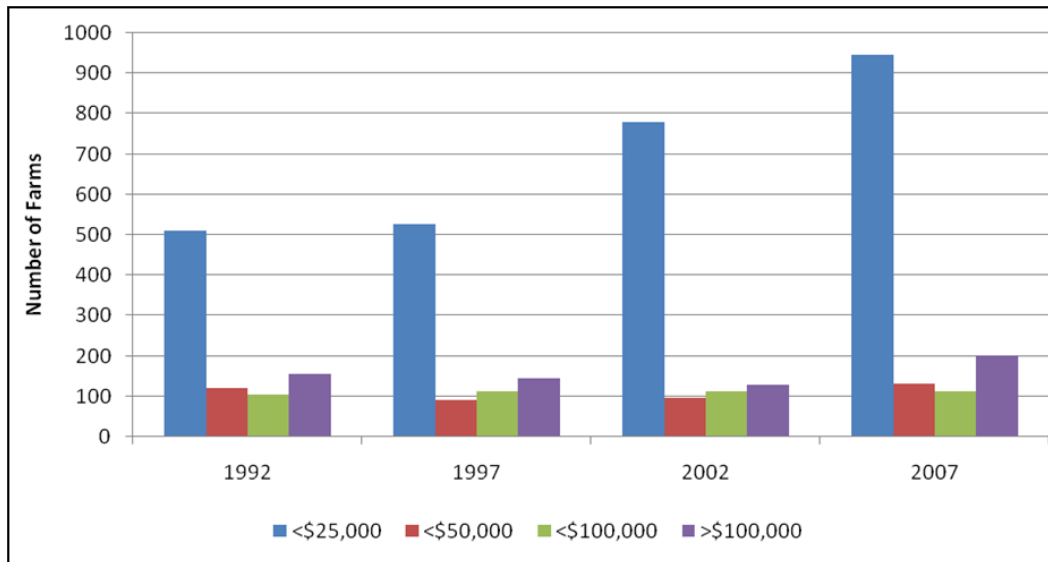


Source: USDA - NASS 2009

Figure 3.30. Total Farm Acres in Fremont County, 1992-2007

There were changes in the number of farms of all sizes as measured by sales of farm products, but the most substantial change was in the number of farms with less than \$25,000 in sales. Figure 3.31, “Number of Farms in Fremont County Grouped by Sales Volume, 1992-2007” (p. 549) shows the change in number of farms in Fremont County grouped by sales volume from 1992 through 2007. The growth in number of farms with smaller output is in accord with the pattern of increasing number of farms with decreasing acreage of farm lands.

Figures 3.29 through 3.31 include all farms in Fremont County, not just those with public land grazing. As noted above, there are only 310 public land allotments, with some permittees holding more than one permit. At least six permittees hold 10 or more allotments.



Source: USDA - NASS 2009

Figure 3.31. Number of Farms in Fremont County Grouped by Sales Volume, 1992-2007

Cattle inventories in the study area declined steadily from 2000 to 2003, rose slightly in 2004, and fluctuated between 2005 and 2007. Overall, the number of cattle decreased from 330,000 in 2000 to 303,000 in 2007. Fremont County had the highest inventory with 105,000 cattle in 2007.

Breeding-sheep inventories declined steadily between 2000 and 2004, stabilized in 2005, but again declined slightly in 2006. The overall decrease was from 90,000 in 2000 to 59,000 in 2008 (USDA - NASS 2009). An extended multi-year drought across much of the Rocky Mountain west contributed to the declines. The presence and magnitude of drought could also affect the portion of permitted grazing area permittees utilize. For example, between 1980 and 2006, the proportion of permitted land actually used for grazing in the Green Mountain common allotment ranged from 16.3 percent to 73.1 percent; low levels of usage correspond with periods of drought.

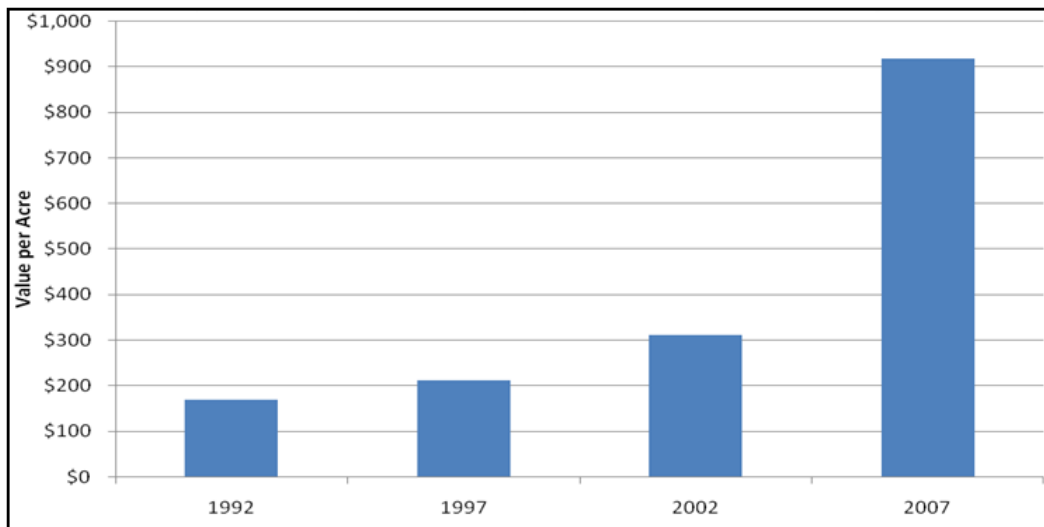
A 1991 study by University of Wyoming economists revealed that agriculture is an important source of export income for the state's economy, because many agricultural products produced in the state are sold outside the state. The study also showed that most inputs to agricultural production come from within the state, and that profits and other income from agricultural production tend to stay in the state. Taken together, these findings indicate that agricultural production is an important contributor to Wyoming's economy (Moline et al. 1991).

It is uncertain whether these trends are still valid, because there has been an increase in ranching operations owned by entities other than the families, all federally licensed slaughter houses in the State of Wyoming have been closed, and there has been an increase in use of out-of-state concentrated animal feeding operations.

In a 2000 study, economists at the University of Wyoming compared the income provided to county governments and public schools to the financial demands on community services from agricultural and residential developments. The study showed that, on average in Wyoming, ranching activity generates almost twice as much income for community services as it requires in expenditures from community services, whereas residential development generates about half as much income as it requires in expenditures (Taylor and Coupal 2000). The study did not

assess the cost to communities to support the subdivision of private ranches into ranchettes or the cost of the resulting loss of wildlife habitat.

Figure 3.32, “Average Market Value per Acre of Farms in Fremont County, 1992-2007” (p. 551) shows the rise in fair market value of farm land in Fremont County from 1992 through 2007 (USDA 2009, USDA 1997). Note that the values in the figure have not been adjusted for inflation.



Source: USDA - NASS 2009

Figure 3.32. Average Market Value per Acre of Farms in Fremont County, 1992-2007

The importance of BLM-administered land for livestock grazing in Fremont County was analyzed using a simulated enterprise level ranch budget (Taylor et al. 2004). Most ranches depend only partially on federal land grazing for forage, but this forage source is a critical part of their livestock operations because of seasonal dependency, even when the proportion of acres of AUMs federal land grazing contributes is relatively small for the operation. Private ranches use much of their land to produce hay for winter feeding. Using hay-producing acreage to graze cattle during summer means a ranch has to purchase hay for winter. The rigidity of seasonal forage availability means that the optimal use of other forages and resources are affected when federal AUMs are not available (Taylor et al. 2004). From 1975 through 2002 potential reductions in income and net ranch returns were greater than the direct economic loss from reductions in federal grazing (Taylor et al. 2004).

Income

Fremont County had the lowest per capita personal income in 2007 of the five counties in the study area; residents of Fremont County had an average per capita income of \$38,744, including wages, salaries, income from investments and rent, and transfer payments such as social security (BEA 2009). This reflects the high unemployment rate on the WRIR which was 32.2 percent in 1999 (Massey and Blevins 1999).

Table 3.69, “Personal Income by Source in Study Area Counties, 2007 (Percent of Total)” (p. 552) summarizes sources of personal income by county in 2007. Among the sectors for which data are available, government, mining, and construction are substantial contributors to income in all five counties.

According to the Bureau of Economic Analysis data, the contribution of the farming and ranching sector in Carbon, Fremont, Hot Springs, and Sweetwater Counties was negative in 2007. This may mean the economic losses in these sectors for proprietors outweighed profits and wages; however, this could also result from an accumulation of inventory – that is, more goods were produced than sold (BEA 2009). The 2007 USDA Census of Agriculture reported that most farming and ranching income in Carbon (97 percent), Fremont (74 percent), and Hot Springs (89 percent) Counties is from livestock and livestock products (USDA - NASS 2009).

Trend data provide a good overview of how the contributions from different sectors in the planning area have changed over time. However, because of a change in the industrial classification system in 2000, it is not possible to construct a single continuous data set that would provide sector-level data both before and after 2000. Accordingly, Figure 3.33, “Historical Earnings Trends, Five-County Aggregation, 1980-2000” (p. 553) shows trend information on sources of income for the five counties, aggregated, from 1980 through 2000.

As Figure 3.33, “Historical Earnings Trends, Five-County Aggregation, 1980-2000” (p. 553) shows, from 1980 through 2000, changes in income (adjusted for inflation) were largely driven by changes in non-labor income, such as investment income and Social Security payments. Income from both government and manufacturing was higher in the early 1980s, but has been lower, and relatively steady, since approximately the mid-1980s. Income from construction increased steadily in the late 1990s. Generally, the relative contributions from different high-level sectors did not change substantially from 1980 through 2000.

Table 3.69. Personal Income by Source in Study Area Counties, 2007 (Percent of Total)

Source	Personal Income				
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater
Farm Earnings	-0.4	-0.2	-0.9	0.0	-0.1
Forestry, Fishing, and Other	N/A	0.2	N/A	N/A	N/A
Mining	3.6	6.2	14.9	18.9	32.1
Utilities	0.8	N/A	N/A	N/A	N/A
Construction	16.0	4.6	N/A	4.9	8.4
Manufacturing	N/A	1.2	2.1	3.4	6.9
Wholesale Trade	3.0	N/A	N/A	5.8	N/A
Retail Trade	4.1	5.0	2.5	4.7	4.7
Transportation and Warehousing	6.4	2.1	2.2	N/A	6.6
Information	0.4	0.9	0.6	0.7	0.4
Finance and Insurance	1.3	1.3	1.4	2.2	1.5
Real Estate and Rental and Leasing	0.8	1.6	0.4	2.4	2.0
Professional and Technical Services	1.6	3.2	1.8	3.3	2.5
Management of Companies and Enterprises	0.2	0.2	N/A	0.3	0.2
Administrative and Waste Services	0.9	0.7	N/A	1.3	2.1

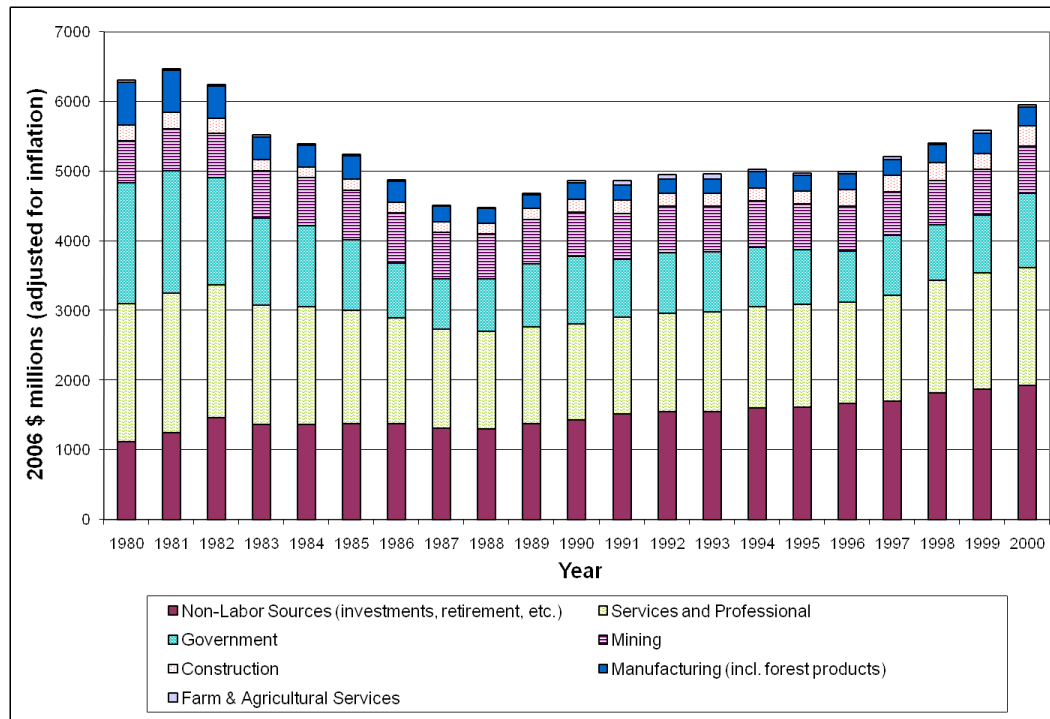
Source	Personal Income				
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater
Educational Services	0.0	N/A	0.1	0.1	0.1
Health Care and Social Assistance	N/A	N/A	5.4	7.7	2.5
Arts, Entertainment, and Recreation	0.7	1.0	1.9	0.5	N/A
Accommodation and Food Services	2.8	1.9	2.5	1.7	2.6
Other Services, Except Public Administration	1.6	2.0	1.2	2.5	3.1
Government and Government Enterprises	17.0	19.0	13.6	8.8	11.5
Categories for which Data were Not Disclosed	10.9	8.4	4.5	3.0	5.9
Non-Labor Income ¹	31.7	38.5	42.2	27.9	14.1
Residence Adjustment ²	-3.3	2.3	3.7	-0.1	-7.2
Total Personal Income (millions of dollars)	619	1,330	179	3,772	1,819

Source: BEA 2009

N/A Not available (data were not disclosed due to confidentiality reasons; the Bureau of Economic Analysis does not report data when there are three or fewer employers in a sector). The line item "Categories for which Data were Not Disclosed" shows the total income attributable to these categories for each county.

¹Non-labor income includes dividend, interest, and rental income, and net transfer payments (retirement, disability, insurance, Medicare, and welfare, less contributions for government social insurance, which are included in earnings for each sector but not included in total personal income). See the text for detail.

²Residence adjustment represents the net inflow of the earnings of inter-area commuters (here, expressed as a percentage of total personal income). A positive number indicates that on balance, county residents tend to commute outside the county to find jobs; a negative number indicates that on balance, people from other counties tend to commute in to find jobs. See the text for detail.



Source: BEA 2009

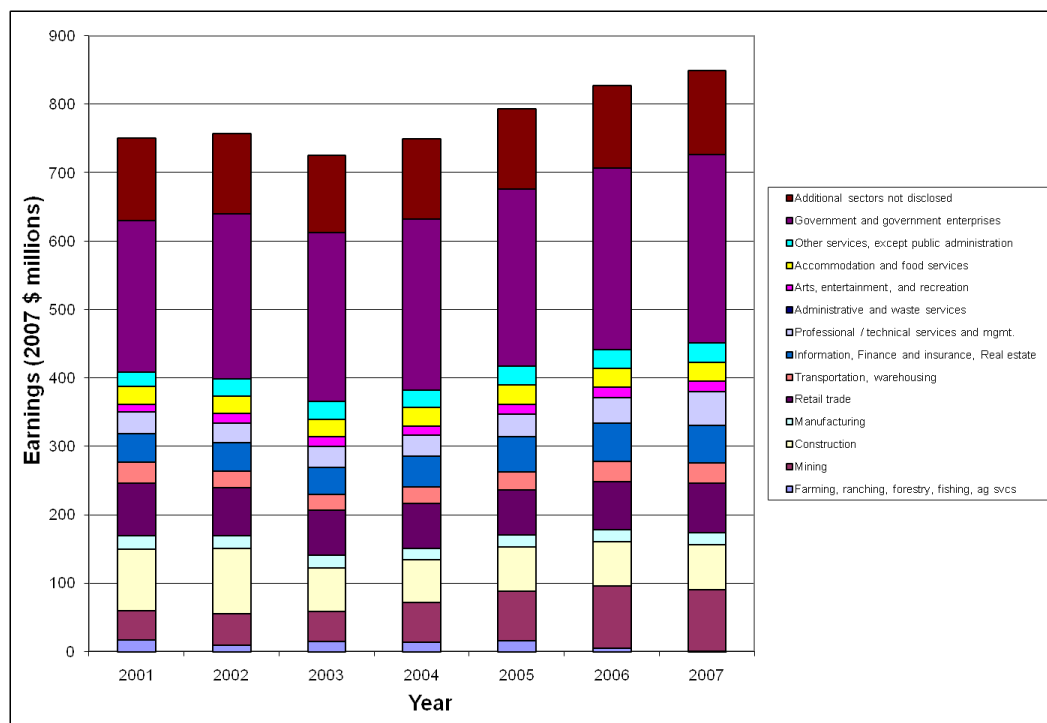
Note: Adjusted to 2006 dollars using Headwaters Economics 2009b.

Incl including

Figure 3.33. Historical Earnings Trends, Five-County Aggregation, 1980-2000

Figure 3.34, “Historical Earnings Trends, Fremont County, 2001-2007” (p. 554) shows similar earnings trends from 2001 through 2007. However, this figure shows data only for Fremont County. Building meaningful trend information for multiple counties is difficult due to the number of sectors for which the Bureau of Economic Analysis does not disclose data (for confidentiality reasons). For example, across the five counties and seven years from 2001 through 2007, data are consistently reported for only seven out of the Bureau of Economic Analysis’s 21 top-level sectors. This problem is alleviated for data from 1980 through 2000 because Headwaters Economics developed a special algorithm to estimate disclosed sectors for these years; however, at present, there is no algorithm for the 2001 through 2007 series. Non-disclosure still prevents some data from being shown for Fremont County, but the problem is reduced by selecting just one county (Fremont) instead of aggregating information for all five counties.

Figure 3.34, “Historical Earnings Trends, Fremont County, 2001-2007” (p. 554) shows that in Fremont County, mining, construction, government, information, finance and insurance, and real estate contributed the most in earnings from 2001 through 2007. Growth in earnings over the last few years since the mid-2000s has been largely due to growth in earnings from mining, construction, professional services, and government. Generally, the relative contributions from different high-level sectors did not change substantially from 2001 through 2007.



Source: BEA 2009. Adjusted to 2007 dollars using Wyoming Economic Analysis Division 2009e

Note: Sectors not disclosed are utilities, wholesale trade, educational services, and health care and social assistance in all years, and in 2001 through 2002 also include management services and administrative and waste services.

ag svcs agriculture services

mgmt management

Figure 3.34. Historical Earnings Trends, Fremont County, 2001-2007

Census County Business Patterns (U.S. Census Bureau 2008b) provides additional data on mining related earnings and employment. Table 3.70, “Earnings and Employment for Mining Activities in Study Area Counties, 2007” (p. 555) lists mining related earnings and employment for the counties in the study area from this source.

Table 3.70. Earnings and Employment for Mining Activities in Study Area Counties, 2007

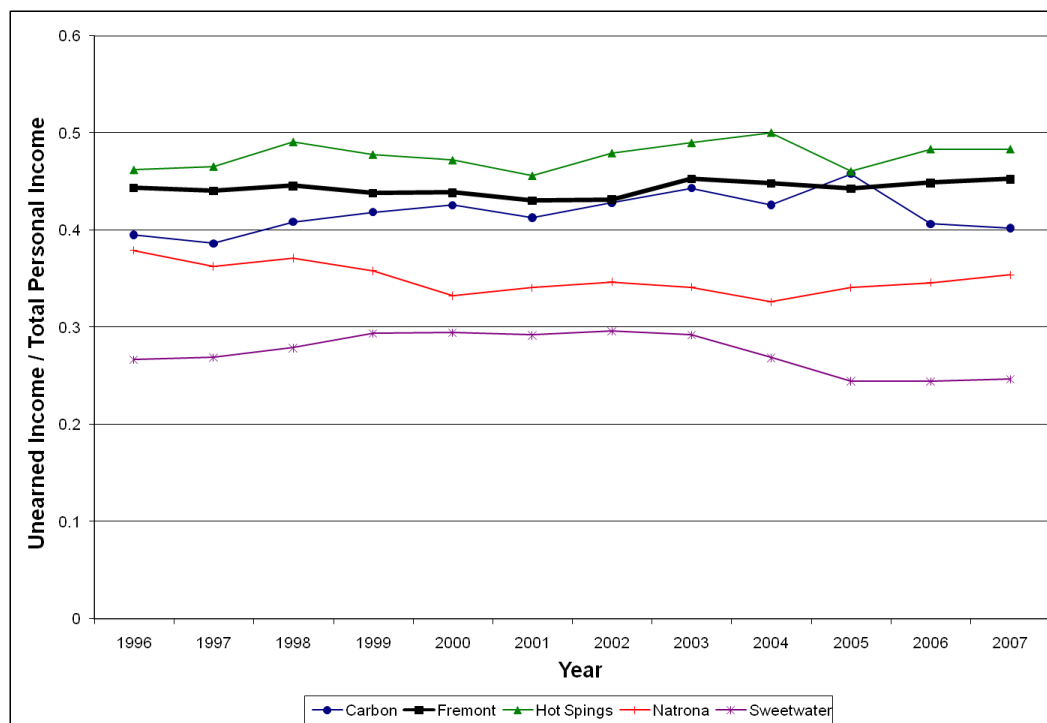
Industry Description	Carbon		Fremont		Hot Springs	
	Employees ¹	Payroll (1,000\$)	Employees	Payroll (1,000\$)	Employees	Payroll (1,000\$)
Mining	185	10,565	841	35,313	397	16,646
Oil and Gas Extraction	20-99	N/A ²	90	7,831	20-99	N/A ²
Crude Petroleum and Natural Gas Extraction	20-99	N/A ²	90	7,831	20-99	N/A ²
Natural Gas Liquid Extraction	0-19	N/A ²	-	-	-	-

Industry Description	Carbon		Fremont		Hot Springs	
	Employees ¹	Payroll (1,000\$)	Employees	Payroll (1,000\$)	Employees	Payroll (1,000\$)
Mining (except oil and gas)	0-19	N/A ²	0-19	N/A ²	0-19	N/A ²
Coal Mining	-	-	0-19	N/A ²	-	-
Bituminous Coal and Lignite Surface Mining	-	-	0-19	N/A ²	-	-
Metal Ore Mining	0-19	N/A ²	0-19	N/A ²	-	-
Gold Ore and Silver Ore Mining	-	-	0-19	N/A ²	-	-
Gold Ore Mining	-	-	0-19	N/A ²	-	-
Other Metal Ore Mining	0-19	N/A ²	0-19	N/A ²	-	-
Uranium-Radium-Vanadium Ore Mining	0-19	N/A ²	0-19	N/A ²	-	-
Nonmetallic Mineral Mining and Quarrying	0-19	N/A ²	-	-	0-19	N/A ²
Stone Mining and Quarrying	-	-	-	-	0-19	N/A ²
Dimension Stone Mining and Quarrying	-	-	-	-	0-19	N/A ²
Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining and Quarrying	0-19	N/A ²	-	-	-	-
Construction Sand and Gravel Mining	0-19	N/A ²	-	-	-	-
Support Activities for Mining	92	3,685	743	26,692	360	14,705
Drilling Oil and Gas Wells	0-19	N/A ²	195	5,999	100-249	N/A ²

Industry Description	Carbon		Fremont		Hot Springs	
	Employees ¹	Payroll (1,000\$)	Employees	Payroll (1,000\$)	Employees	Payroll (1,000\$)
Support Activities for Oil and Gas Operations	81	2,875	534	19,918	192	11,932
Support Activities for Coal Mining	-	-	0-19	N/A ²	-	-
Industry Description			Natrona		Sweetwater	
			Employees	Payroll (1,000\$)	Employees	Payroll (1,000\$)
Mining			2,913	180,653	2,621	160,175
Oil and Gas Extraction			214	13,746	328	21,998
Crude Petroleum and Natural Gas Extraction			208	13,246	153	10,336
Natural Gas Liquid Extraction			0-19	N/A ²	100-249	N/A ²
Mining (except oil and gas)			20-99	N/A ²	500-999	N/A ²
Coal Mining			-	-	500-999	N/A ²
Bituminous Coal and Lignite Surface Mining			-	-	500-999	N/A ²
Bituminous Coal Underground Mining			-	-	100-249	N/A ²
Metal Ore Mining			0-19	N/A ²	-	-
Gold Ore and Silver Ore Mining			-	-	-	-
Gold Ore Mining			-	-	-	-
Other Metal Ore Mining			0-19	N/A ²	-	-
Uranium-Radium-Vanadium Ore Mining			0-19	N/A ²	-	-
Nonmetallic Mineral Mining and Quarrying			20-99	N/A ²	100-249	N/A ²
Stone Mining and Quarrying			-	-	0-19	N/A ²
Other Crushed and Broken Stone Mining and Quarrying			-	-	0-19	N/A ²
Sand, Gravel, Clay, and Ceramic and Refractory Minerals Mining and Quarrying			20-99	N/A ²	-	-
Construction Sand and Gravel Mining			0-19	N/A ²	-	-
Clay and Ceramic and Refractory Minerals Mining			20-99	N/A ²	-	-
Other Nonmetallic Mineral Mining and Quarrying			0-19	N/A ²	100-249	N/A ²
Potash, Soda, and Borate Mineral Mining			-	-	100-249	N/A ²
All Other Nonmetallic Mineral Mining			0-19	N/A ²	-	-
Support Activities for Mining			2,642	N/A ²	1,389	81,626
Drilling Oil and Gas Wells			1,149	80,717	119	8,552
Support Activities for Oil and Gas Operations			1,456	81,641	1,217	60,843
Support Activities for Coal Mining			0-19	N/A ²	2,049	N/A ²
Support Activities for Metal Mining			0-19	N/A ²	-	-
Support Activities for Nonmetallic Minerals (except Fuels)			0-19	N/A ²	0-19	N/A ²
Source: U.S. Census Bureau 2008b						
Note: Number of employees is for mid-March 2007. Payroll data are for the entire year.						
¹ For some sectors and sub-sectors, the data source reveals only a range for the number of employees so as not to disclose confidential business information (there are very few employers in the sector).						
² The data source does not reveal data on payrolls for this sub-sector due to confidentiality requirements (there are relatively few employers in the sector).						

Although the County Business Patterns data do not disclose all data on employee counts and payrolls due to confidentiality requirements, the data provided help to show the economic importance of mineral commodities. Table 3.70, “Earnings and Employment for Mining Activities in Study Area Counties, 2007” (p. 555) shows that oil and gas extraction and operations support activities substantially contribute to mining-related earnings in all five counties. Based on summing actual employment where those data are provided, and the lower bounds of ranges where actual employment is not shown, oil and gas extraction and operations support contributes at least 101 jobs in Carbon County (at least 55 percent of mining-related jobs), 819 jobs in Fremont County (97 percent of mining-related jobs), at least 312 jobs in Hot Springs County (at least 79 percent of mining-related jobs), 2,819 jobs in Natrona County (97 percent of mining-related jobs), and 1,664 jobs in Sweetwater County (63 percent of mining-related jobs).

Transfer payments such as Social Security, disability, insurance, Medicare, and welfare, and income from dividends, interest, and rent, make up a substantial portion of income in all five counties. Figure 3.35, “Percent of Total Personal Income from Dividends, Interest, Rent, and Transfer Payments ” (p. 558) shows the trend in percentage of income from these sources over time. As the figure shows, the share of total income from unearned income remained relatively constant in Fremont County between 1996 and 2007, starting at 44 percent and ending at 45 percent. In Sweetwater County, the percentage of total income from unearned income rose from 1996 to 2002 and then declined between 2002 and 2006. Between 2006 and 2007, the percentage of total income from unearned income in Sweetwater County rose slightly from 24 percent to 25 percent, about 2 percent lower than the 1996 level. The percentage of income from unearned income fell 5 percent in Natrona County between 1996 and 2000, and between 2001 and 2007 the percentage of income from unearned income remained relatively constant between 34 and 35 percent. In Hot Springs County, the percentage of income from unearned income increased between 1996 and 2004, reaching up to 50 percent before decreasing to 48 percent in 2007. The total percentage of income from unearned income in Carbon County increased up to 46 percent by 2005 before decreasing to the 1996 level of 40 percent by 2007. In Wyoming as a whole, the percentage of income from unearned income remained relatively constant, increasing 3 percent from 37 percent to 40 percent between 1996 and 2007. Note, however, that the absolute amount (adjusted for inflation) of income from transfer payments, dividends, interest, and rent has increased in all five counties (Figure 3.36, “Amount of Dividends, Interest, Rent, and Transfer Payments” (p. 559)) and the state.

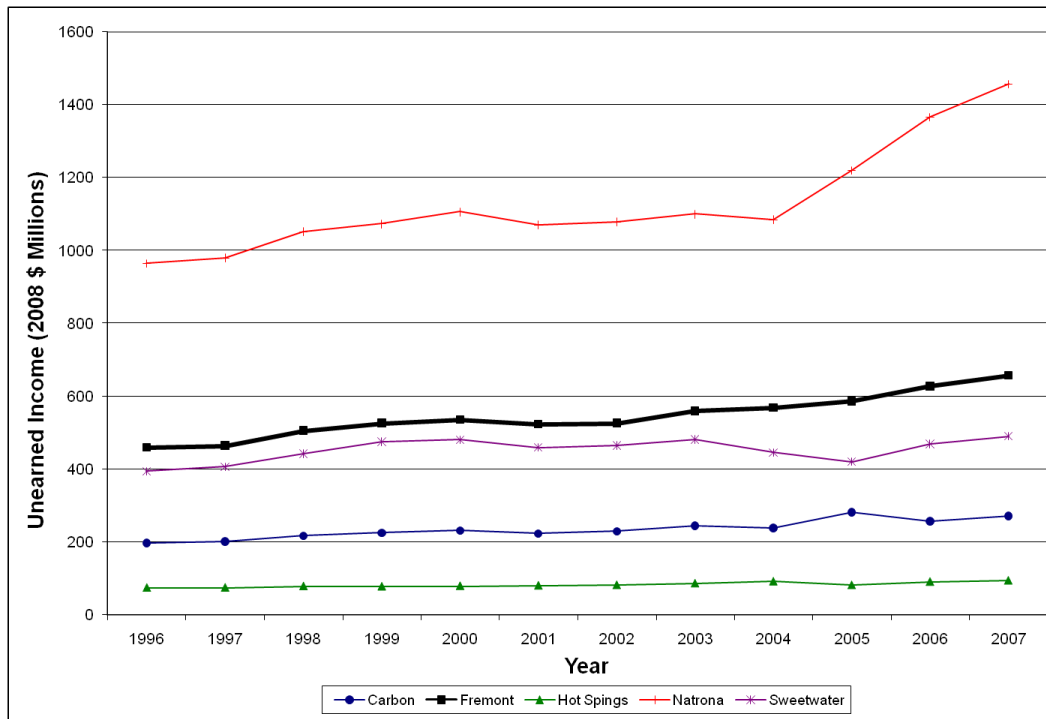


Source: BEA 2009

Figure 3.35. Percent of Total Personal Income from Dividends, Interest, Rent, and Transfer Payments

Most of the counties had more non-labor (unearned) income than the United States as a whole in 2007 (nationally, the rate was 32 percent). Several factors could cause a higher proportion of income from dividends, interest, rent, and transfer payments, including a higher proportion of families with incomes derived from assets such as stocks and real estate, or a higher proportion of people receiving income from government payments such as Social Security.

At a regional level, a larger share of non-labor income could lead to views different from those traditionally held in an area dominated by extractive industries. In addition, these changes in views often tend to support preservation policies that favor a less-intense dependence on the extractive industries.



Source: BEA 2009

Note: Adjusted for inflation using the Wyoming Cost of Living Index for the central region (Converse, Fremont, and Natrona Counties) (Wyoming Economic Analysis Division 2009e).

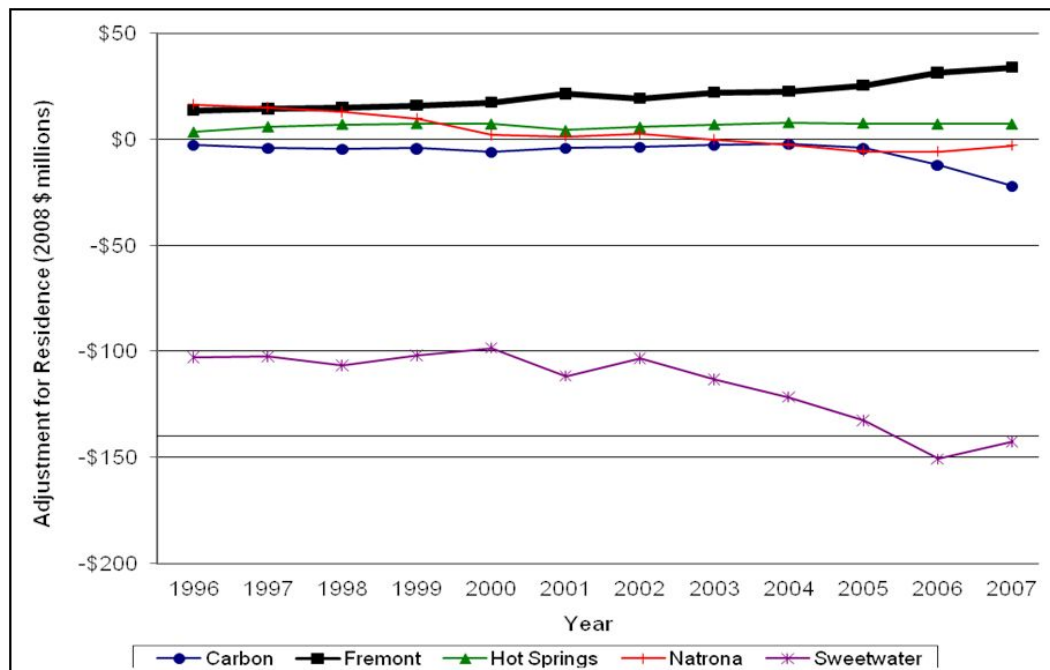
Figure 3.36. Amount of Dividends, Interest, Rent, and Transfer Payments

Diversified regional economies in the west that are located next to protected public lands tend to do better from an economic standpoint compared to those that rely primarily on the extractive industries (BLM 2009a). In addition to being more stable, there is some evidence to suggest that more diverse economic regions tend to generate faster growth over the long term. A recent study by a nonprofit research group (Headwaters Economics 2008) compared long-term growth in “energy-focusing” counties in the western United States with “peer counties” of similar size and found that over the long term, employment and income grew measurably faster in the peer counties. The study identified 26 energy-focusing counties, rural counties with populations less than 57,000 and more than 7 percent of private-sector employment from energy-related industries, and compared their growth with 254 peer counties (comparable counties with lower energy-related employment). The study found that from 1990 to 2005, inflation-adjusted personal income in the energy-focusing counties grew at an average rate of 2.3 percent, compared to 2.9 percent for the peer counties. Employment in energy-focusing counties grew an average of 1.8 percent compared to 2.3 percent for peer counties. The analysis period for long-term growth studies must be chosen carefully so as to not bias the results through the choice of an ending year that coincides with an energy bust. In this case, the timeframe was well chosen. The starting year for the analysis coincides with both a national recession and a relative low point for energy development, and the ending year coincides with the approximate peak of the most recent economic expansion, which included an energy boom.

Not fully captured in this analysis is the influx of residents who are attracted to the Lander area by the amenities of the community, in part reflecting the management of public lands, and in part reflecting the institutions such as NOLS located in the community. To the extent that economic

condition is measured by labor income, the economic contribution of these residents to the local communities can be understated or not measured.

Another indicator of income is the residence adjustment, which measures cross-county flows of income and earnings. While many people live and work in the same county, other people work outside the county in which they live (they commute across county boundaries). For each county, the net residence adjustment represents the net inflow of earnings due to cross-county income flows, or the difference between the income of those who reside in the county and those who work in the county. Thus, a residence adjustment more than zero indicates that, on balance, the flow of income due to inter-county commuting is positive; that is, people tend to commute outside the county to find jobs. Similarly, a county with a residence adjustment less than zero indicates that people from other counties tend to commute in to find jobs. Figure 3.37, “Resident Adjustment Factors” (p. 561) shows the residence adjustment factors for each of the five counties, in real terms (adjusted for inflation). The figure shows that the residence adjustment in Sweetwater County is far more substantial than in the other four counties in the study area; Sweetwater County has a large negative residence adjustment (-\$143 million in 2007), which indicates that there are a large number of people commuting into Sweetwater County to work. In 2007, Carbon and Natrona were the only other counties with a net influx of workers, with residence adjustments of -\$22 million and -\$3 million, respectively. The residence adjustment was \$34 million for Fremont and \$7 million for Hot Springs County; therefore, Fremont County had the largest income generated by jobs outside the county.



Source: BEA 2009

Note: Adjusted for inflation using the Wyoming Cost of Living Index for the central region (Converse, Fremont, and Natrona Counties) (Wyoming Economic Analysis Division 2009e).

Figure 3.37. Resident Adjustment Factors

Employment

The breakout of employment by industry shows a pattern similar to that of the personal income statistics, highlighting the importance of mining, government, construction, and services in all five counties (excluding mining in Carbon County). Table 3.71, “Employment by Industry in Study Area Counties, 2007 (Percent of Total)” (p. 562) summarizes total employment by sector for the counties in the study area. Note that data on employment for a finer breakout of the mining sector is shown in Table 3.71, “Employment by Industry in Study Area Counties, 2007 (Percent of Total)” (p. 562).

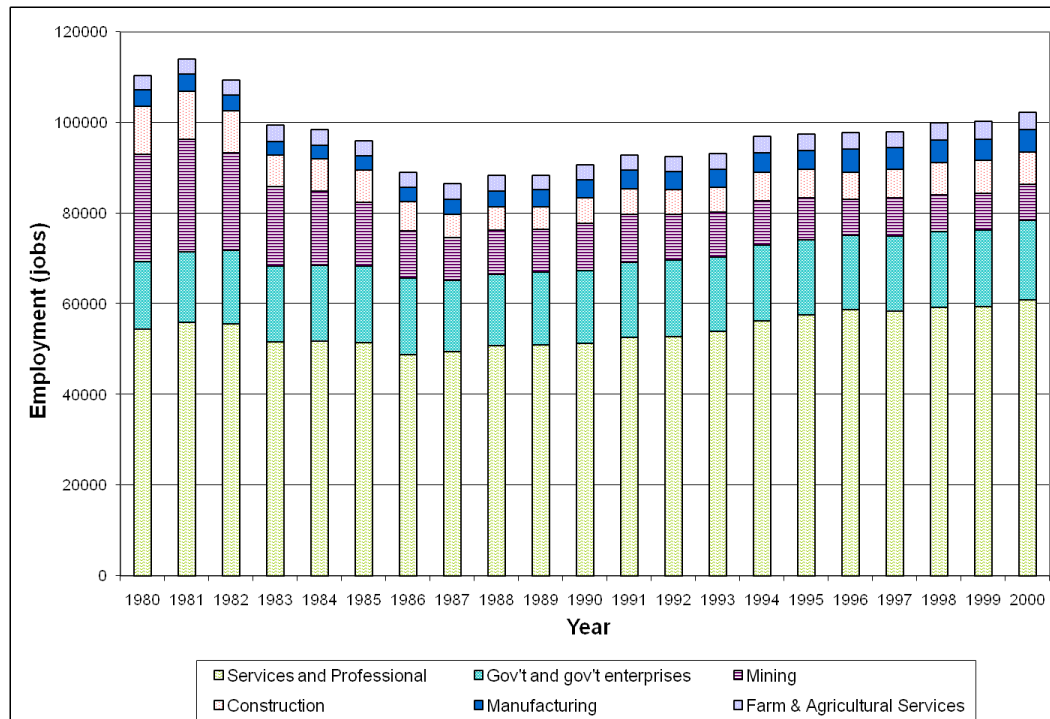
Table 3.71. Employment by Industry in Study Area Counties, 2007 (Percent of Total)

Source	Number of Jobs					
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater	Wyoming
Farm Employment	4.4	4.6	5.8	0.8	0.6	2.9
Forestry, Fishing, and Other	N/A	0.8	N/A	N/A	N/A	0.7
Mining	3.2	4.2	7.6	9.5	20.0	8.0
Utilities	0.6	N/A	N/A	N/A	N/A	0.7
Construction	14.2	8.2	N/A	7.9	8.9	9.4
Manufacturing	N/A	2.7	2.9	4.1	4.3	3.1
Wholesale Trade	2.7	N/A	N/A	5.4	N/A	2.5
Retail Trade	9.8	11.4	9.3	12.3	10.0	10.7
Transportation and Warehousing	5.5	2.6	2.8	N/A	5.9	3.8
Information	0.7	1.5	1.5	1.2	0.8	1.2
Finance and Insurance	2.0	2.1	2.8	3.4	2.1	3.0
Real Estate and Rental and Leasing	4.5	4.7	3.1	5.1	3.5	4.6
Professional and Technical Services	2.6	3.7	3.6	4.7	2.7	4.4
Management of Companies and Enterprises	0.2	0.2	N/A	0.2	0.2	0.3
Administrative and Waste Services	2.7	2.3	N/A	4.2	3.5	3.4
Educational Services	0.3	N/A	(L)	0.6	0.5	0.8
Health Care and Social Assistance	N/A	N/A	11.0	11.1	4.3	7.2
Arts, Entertainment, and Recreation	1.9	1.6	3.1	1.7	N/A	1.7
Accommodation and Food Services	9.5	7.0	10.4	6.9	8.1	8.5
Other Services, Except Public Administration	4.9	6.2	7.2	6.1	4.9	5.2

Source	Number of Jobs					
	Carbon	Fremont	Hot Springs	Natrona	Sweetwater	Wyoming
Government and Government Enterprises	19.1	22.8	18.4	11.2	14.1	17.9
Data were Not Disclosed	11.3	13.3	10.2	3.4	5.4	0.0
Total Employment (2007)	11,340	24,040	3,192	53,927	30,878	389,776
Source: BEA 2009						
N/A Not available (not disclosed by the data source for reasons of confidentiality).						
(L) Less than 10 jobs, but the estimates for this item are included in the totals.						

As in the earnings section, this section provides trend data to illustrate how the contributions from different sectors in the planning area have changed over time. The same change in the industrial classification system in 2000 makes it impossible to construct a single continuous data set that would provide sector-level data both before and after 2000. In addition, the same problems with non-disclosure make it impossible to provide meaningful data for the five counties for the seven years from 2001 through 2007. Accordingly, Figure 3.38, “Historical Employment Trends, Five-County Aggregation, 1980-2000” (p. 563) shows trend information on sources of employment for the five counties, aggregated, from 1980 to 2000, and Figure 3.39, “Historical Employment Trends, Fremont County, 2001-2007” (p. 564) shows information on employment for Fremont County from 2001 to 2007.

As Figure 3.38, “Historical Employment Trends, Five-County Aggregation, 1980-2000” (p. 563) shows, from 1980 through 2000, changes in employment were largely driven by changes in service and professional employment. Employment in construction and mining was higher in the early 1980s than at any other point through 2000, but did grow somewhat from a low in the late 1980s through 2000. Generally, the relative contributions from different high-level sectors did not change substantially from 1980 through 2000.



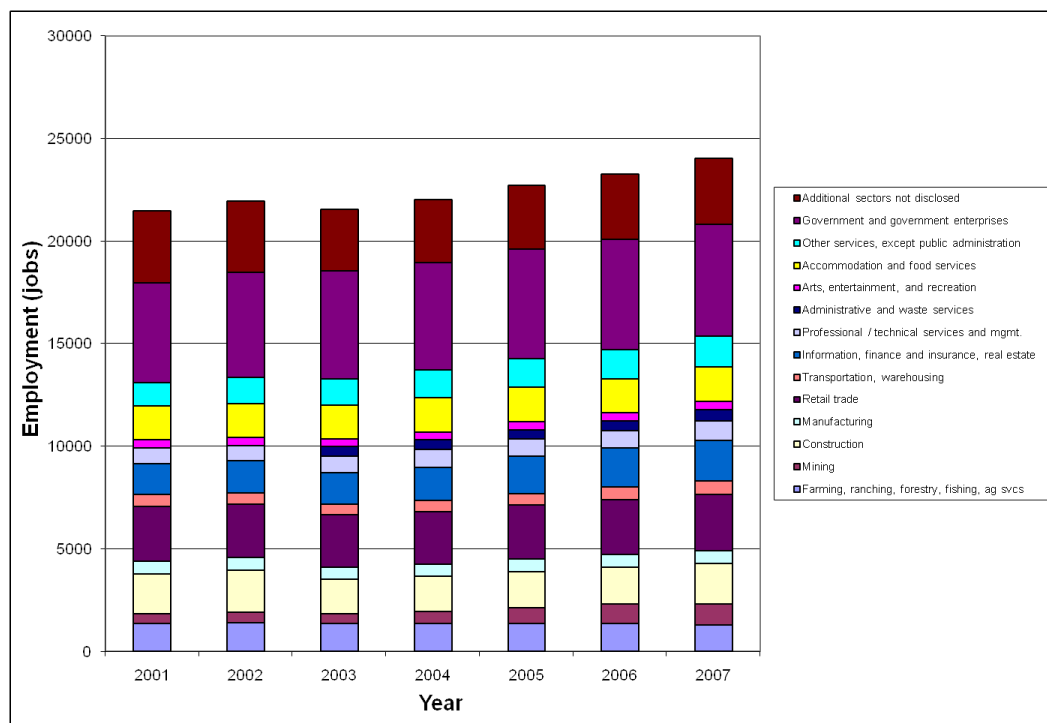
Source: BEA 2009

Gov't Government

Figure 3.38. Historical Employment Trends, Five-County Aggregation, 1980-2000

Figure 3.39, “Historical Employment Trends, Fremont County, 2001-2007” (p. 564) shows that in Fremont County all sectors grew more or less equally; that is, the relative contributions from different high-level sectors did not change substantially from 2001 through 2007. The relative contribution of the mining sector grew slightly over the period shown, but for all other sectors, relative contributions have been basically stable since 2001.

Average earnings per job in 2007 were lower than the national and state averages in Carbon, Fremont, and Hot Springs Counties. Sweetwater County and Natrona County had an average earnings per job higher than both the nation and state. Table 3.72, “Average Earnings per Job for Study Area Counties, Wyoming, and the Nation, 2007” (p. 565) lists the average earnings per job by county in 2007. Figure 3.40, “Average Earnings per Job, 2001-2007 (adjusted for inflation)” (p. 565) shows the average earnings per job by county from 2001 through 2007. In each of the counties, the state, and the nation, average earnings per job remained more or less steady, sometimes with very slight increases or decreases.



Source: BEA 2009

Note: Sectors not disclosed are utilities, wholesale trade, educational services, and health care and social assistance in all years, and in 2001 through 2002 also include management services and administrative and waste services.

ag svcs Agriculture services

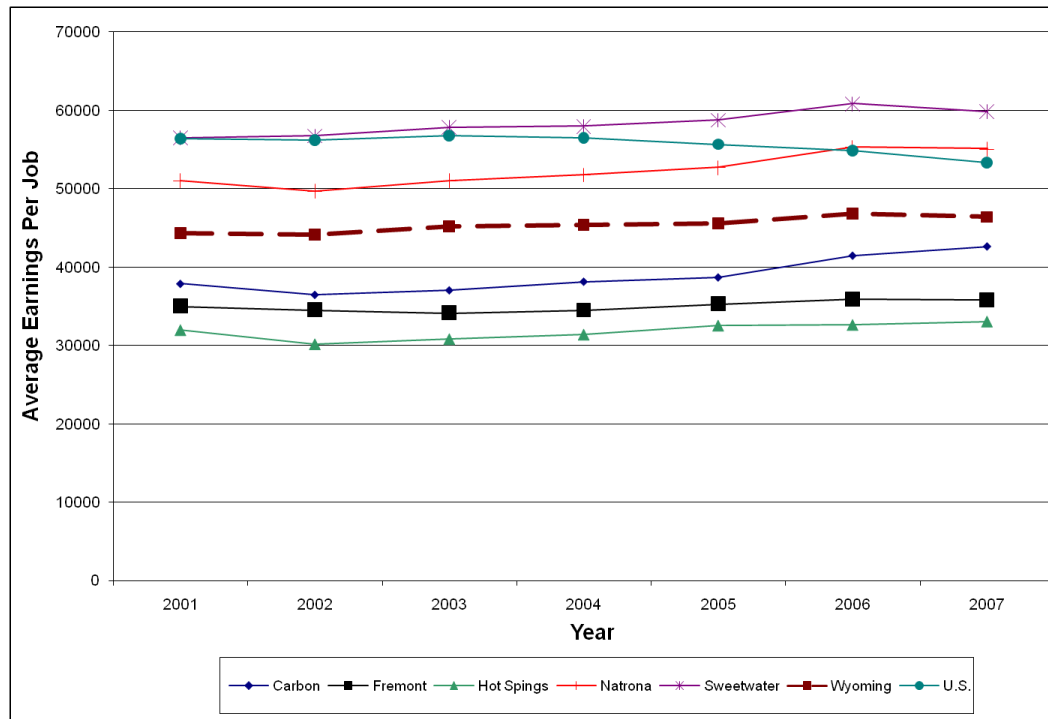
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Figure 3.39. Historical Employment Trends, Fremont County, 2001-2007

Table 3.72. Average Earnings per Job for Study Area Counties, Wyoming, and the Nation, 2007

Locality	Average Earnings Per Job
Carbon County	\$39,047
Fremont County	\$32,766
Hot Springs County	\$30,268
Natrona County	\$50,472
Sweetwater County	\$54,847
Wyoming	\$42,506
United States	\$48,900

Source: BEA 2009



Source: BEA 2009

Note: Adjusted for inflation using Wyoming Economic Analysis Division 2009e.

U.S. United States

Figure 3.40. Average Earnings per Job, 2001-2007 (adjusted for inflation)

It is important to consider how different average wages could affect the ability of different employers to attract workers. For example, a study in nearby Sublette County (Jacquet 2006) found that wages for jobs in gas development and exploration are higher than in any other sector and are high for both unskilled and skilled workers. Depending on the need for labor in relatively high-paying sectors, this could adversely affect the ability of other employers (in relatively low-paying sectors) to attract workers. Table 3.73, “Fourth Quarter 2008 Average Monthly Employment and Average Weekly Wage for the Five Counties in the Study Area” (p. 567) lists recent data (from the fourth quarter of 2008) on relative earnings by sector and total employees in each sector for the five counties. As the table shows, with the exception of Carbon County, the mining sector (including oil and gas development) has the highest average weekly wage of any sector. This observation is also true for the state as a whole. In Carbon County, construction has high, albeit comparable, average weekly wages compared to the mining sector. Furthermore, in Sweetwater County, average weekly wages in the manufacturing sector are comparable to the mining sector.

Table 3.73. Fourth Quarter 2008 Average Monthly Employment and Average Weekly Wage for the Five Counties in the Study Area

Sector	Carbon		Fremont		Hot Springs	
	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)
Agriculture, Forestry, Fishing, and Hunting	198	652	107	467	N/A	N/A
Animal Production	183	668	71	411	N/A	N/A
Mining	467	1,307	898	1,376	192	1,447
Oil and Gas Extraction	N/A	N/A	N/A	N/A	N/A	N/A
Mining, Except Oil and Gas	N/A	N/A	N/A	N/A	N/A	N/A
Support Activities for Mining	407	1,296	592	1,219	122	1,405
Utilities	55	1,035	55	1,381	N/A	N/A
Construction	908	1,430	1,154	804	104	1,016
Manufacturing	N/A	N/A	423	656	66	600
Wholesale Trade	75	898	348	869	28	804
Retail Trade	794	505	2,101	530	183	409
Transportation and Warehousing	260	1,028	413	1,066	82	920
Information	82	571	243	603	44	313
Finance and Insurance	145	694	333	784	49	782
Real Estate and Rental and Leasing	96	343	397	890	8	344
Administrative and Waste Services	113	682	179	827	N/A	N/A
Health Care and Social Assistance	447	711	1,693	735	282	551
Arts, Entertainment, and Recreation	50	741	108	252	47	279
Accommodation and Food Services	906	321	1,399	265	251	252
Other Services, Except Public Administration	159	521	506	587	57	384
Total Government	2,061	795	5,737	748	556	649

Sector	Carbon		Fremont		Hot Springs	
	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)
All Private Sectors (Non-Government)	5,369	861	11,156	714	1,492	659
All Sectors	7,430	843	16,892	726	2,048	656
Sector	Natrona		Sweetwater		Wyoming	
	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)
Agriculture, Forestry, Fishing, and Hunting	140	717	11	628	2,373	617
Animal Production	109	791	N/A	N/A	1,656	620
Mining	3,995	1,670	6,266	1,592	30,372	1,511
Oil and Gas Extraction	814	1,592	544	1,510	4,719	1,704
Mining, Except Oil and Gas	97	1,506	2,257	1,714	9,876	1,500
Support Activities for Mining	3,083	1,697	3,465	1,526	15,776	1,460
Utilities	N/A	N/A	N/A	N/A	2,657	1,598
Construction	3,078	1,233	2,162	1,278	27,915	1,014
Manufacturing	1,915	984	1,329	1,522	10,169	990
Wholesale Trade	2,738	1,262	810	1,149	9,240	1,164
Retail Trade	5,404	554	2,545	552	32,383	500
Transportation and Warehousing	953	956	1,486	1,222	11,018	913
Information	518	707	213	514	4,673	686
Finance and Insurance	1,085	1,016	454	962	7,290	933
Real Estate and Rental and Leasing	976	994	508	1,195	4,450	823
Administrative and Waste Services	1,305	585	537	748	7,873	600
Health Care and Social Assistance	5,208	952	962	652	32,086	840
Arts, Entertainment, and Recreation	375	302	132	207	3,744	518
Accommodation and Food Services	3,807	292	2,469	347	29,752	317
Other Services, Except Public Administration	1,931	767	659	734	8,889	628

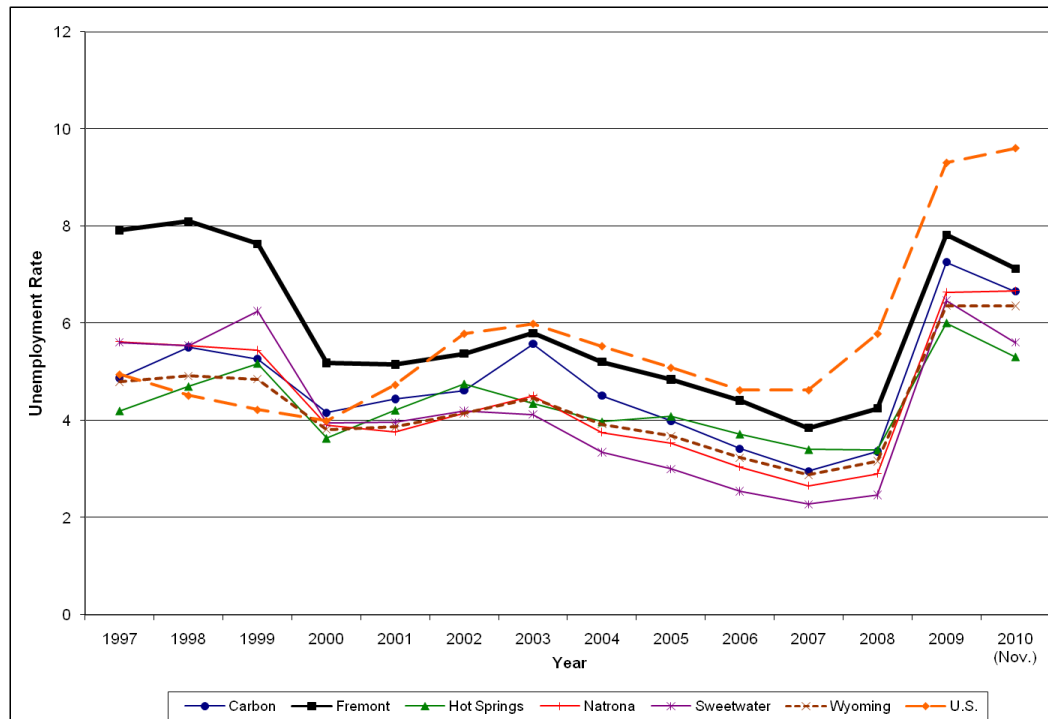
Sector	Carbon		Fremont		Hot Springs	
	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)	Average Monthly Employment	Average Weekly Wage (\$)
Total Government	5,650	900	4,380	811	64,756	837
All Private Sectors (Non-Government)	35,187	935	21,656	1,114	222,722	854
All Sectors	40,837	930	26,036	1,063	287,478	850
Sources: Wyoming Department of Employment 2009a; Wyoming Department of Employment 2009b; Wyoming Department of Employment 2009c; Wyoming Department of Employment 2009d; Wyoming Department of Employment 2009e; Wyoming Department of Employment 2009f; Wyoming Department of Employment 2009g						
N/A Not available (not disclosed in the data source, for reasons of confidentiality).						

All five counties follow the general unemployment trend observed at the national and state levels from 1997 through 2010. As of November 2010, all five counties had lower unemployment than the national average of 9.6 percent. Fremont County had an unemployment rate of 7.1 percent, Carbon County 6.7 percent, Hot Springs County 5.3 percent, Natrona County 6.7 percent, and Sweetwater County had an unemployment rate of 5.6 percent. Wyoming had 6.4 percent unemployment overall (BLS 2011a, BLS 2011b). These rates are generally about three percentage points higher than prior to the latest economic downturn, when unemployment in the five counties was generally between 2 and 5 percent. Figure 3.41, “Unemployment Rates, 2000-2008” (p. 569) shows unemployment rates in recent years for the five counties in the study area, Wyoming, and the United States. Unemployment in the study area has been lower than the national rate since at least 2002, and has been decreasing since 2003 in all five counties (and since 2002 in Sweetwater and Hot Springs Counties). Unemployment in Fremont County has been larger than in the four other counties and the state during this period.

Unemployment statistics are shifting rapidly due to the economic downturn that began in December 2007. While the recession appears to have affected Wyoming less than other states, the state has not been immune. For each of the counties in the study area, unemployment rose between 2007 and 2008 for the first time since 2003.

Tax Revenue

Activities on public lands contribute to the fiscal well-being of federal, state and local governments. BLM management actions have the potential to affect tax revenues from mining and mineral production; travel, tourism, and recreation; and livestock grazing.



Sources: BLS 2009, BLS 2011a, and BLS 2011b

U.S. United States

Figure 3.41. Unemployment Rates, 2000-2008

Mining, Including Oil and Gas

The mining industry contributes substantially to state and local tax revenues and explains in part why Wyoming has no income tax. The Wyoming State Auditor reported that state mineral severance taxes and federal mineral royalties returned to the state represented 31 percent of total state revenues in Fiscal Year 2007, a total of \$1.45 billion. Sales and use taxes represented another 11 percent of total state revenues (Wyoming State Auditor 2008). The Wyoming Legislative Service Office (WLSO 2003) indicated that the mining sector paid about \$806 million in state and local tax revenues in Fiscal Year 2002. This represents 54 percent of total state and local tax revenues from major tax sources (severance, ad valorem, sales and use, cigarettes, gross receipts, liquor, and franchise taxes) for Fiscal Year 2002 (WLSO 2003).

Oil and gas production on federal lands in Wyoming is subject to state, federal, and local taxes. Ad valorem production and production-equipment taxes are payable to the county in which the production occurs. Because oil and gas are produced from all five study area counties, ad valorem production and production equipment taxes are important for these counties.

State severance taxes are levied on current production at the rate of 6 percent of the taxable value of crude oil and natural gas, and at 7 percent of taxable value for surface coal, 4 percent for trona, and 2 percent for most other minerals. Taxable value is defined as the gross sales value minus certain allowable deductions for royalties, transportation, and natural gas processing. Rates are lower for less productive stripper wells and new wells (Wyoming DOR 2008). State and local taxes, including the ad valorem tax, also apply to coal and trona mining. Using the data on

production valuation shown above, along with state severance tax rates, it is possible to estimate state severance tax collections for each county for the different mineral products. Table 3.74, “Estimated State Severance Tax Collections (dollars) on Mineral Production in the Study Area Counties, Production Year 2007” (p. 571) lists estimated state severance tax collections for the counties for Production Year 2007.

Table 3.74. Estimated State Severance Tax Collections (dollars) on Mineral Production in the Study Area Counties, Production Year 2007

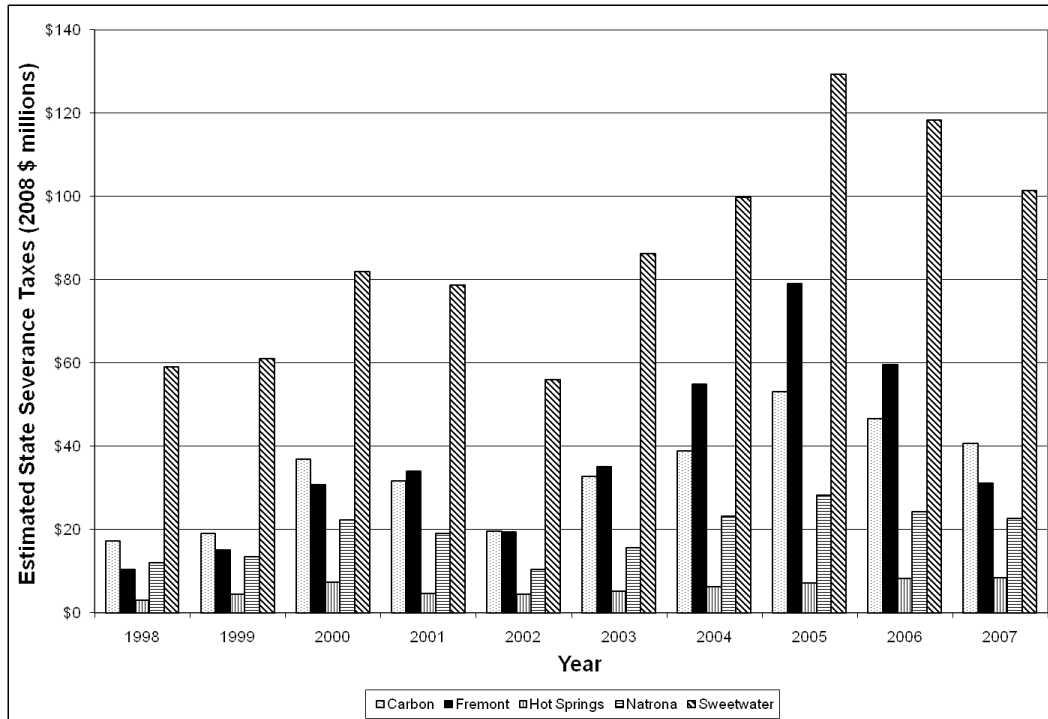
Mineral	Carbon	Fremont	Hot Springs	Natrona	Sweetwater
Crude Oil	4,985,500	7,716,500	5,653,800	13,042,300	20,989,500
Stripper Oil	272,400	624,100	2,019,200	706,800	33,600
Natural Gas	31,810,200	20,274,400	62,200	7,059,200	50,407,500
Surface Coal	266,800	0	700	0	6,708,600
Underground Coal	0	0	0	0	1,329,800
Trona	0	0	0	0	13,587,400
Bentonite	0	0	500	11,300	0
Sand and Gravel	31,200	18,700	1,000	60,600	45,400
Uranium	0	0	0	0	0
Decorative Stone	0	0	0	0	0
Total	37,366,100	28,633,700	7,737,400	20,880,200	93,101,800

Source: Calculated from data in Wyoming DOR 2008.

Note: Estimated using state severance tax rates of 6 percent of taxable valuation for crude oil and natural gas, 4 percent for stripper oil and trona, and uranium, 7 percent for surface coal, 3.75 percent for underground coal, and 2 percent for all other minerals shown. Rounded to the nearest \$100.

As the table shows, state severance taxes based on production in the counties in the study area were greatest in Sweetwater County, which is consistent with the relative importance of mining for employment and earnings in that county. Natural gas was the largest contributor to state severance taxes for all counties except Hot Springs (crude oil).

Table 3.74, “Estimated State Severance Tax Collections (dollars) on Mineral Production in the Study Area Counties, Production Year 2007” (p. 571) also shows that gas, oil, coal, and trona accounted for most of the state severance tax collections in the study area counties in 2007. Figure 3.42, “Estimated State Severance Taxes, 1998-2007” (p. 571) shows historical trends in estimated state severance taxes based on production of these commodities in the counties in the study area (the data on assessed valuation shown in Figure 3.26, “Assessed Valuation of Oil Production by County in the Study Area, 1998-2007” (p. 543) and Figure 3.27, “Assessed Valuation of Gas Production by County in the Study Area, 1998-2007” (p. 544)). Severance taxes on natural gas, coal, trona, and other minerals are distributed according to a legislatively approved formula. Most of the revenues are transferred to the state general fund, the state budget reserve account, and the Permanent Wyoming Mineral Trust Fund. In recent years, less than 4 percent of the total has been distributed to cities, towns, and counties across the state.



Sources: Calculated using data in Wyoming DOR 1999; Wyoming DOR 2000; Wyoming DOR 2001a; Wyoming DOR 2002; Wyoming DOR 2003; Wyoming DOR 2004; Wyoming DOR 2005; Wyoming DOR 2006; Wyoming DOR 2007; Wyoming DOR 2008

Note: Adjusted for inflation using Wyoming Economic Analysis Division 2009e.

Figure 3.42. Estimated State Severance Taxes, 1998-2007

Local ad valorem production taxes are levied on sales of oil and gas. Ad valorem production tax rates vary by county and within counties. In 2007, average tax rates on mineral production were about 6.2 percent in Carbon County, 7.1 percent in Fremont County, 7 percent in Hot Springs County, 6.6 percent in Natrona County, and 6.6 percent in Sweetwater County (Wyoming DOR 2007). Based on these tax rates and the total taxable value of mineral production, it is possible to estimate ad valorem production tax assessments in the counties. According to the Wyoming Department of Revenue, total taxable value of mineral production for Production Year 2007 was \$625 million in Carbon County, \$483 million in Fremont County, \$146 million in Hot Springs County, \$356 million in Natrona County, and \$1,664 million in Sweetwater County (Wyoming DOR 2008). Thus, applying the 2007 tax rates to 2007 mineral production, the Wyoming Department of Revenue calculated ad valorem mineral production tax assessments of \$39 million in Carbon County, \$34 million in Fremont County, \$10 million in Hot Springs County, \$23 million in Natrona County, and \$110 million in Sweetwater County (Wyoming DOR 2008). The data in Table 3.74, “Estimated State Severance Tax Collections (dollars) on Mineral Production in the Study Area Counties, Production Year 2007” (p. 571) illustrates the relative importance of different minerals in the counties in contributing to these tax assessments. The table shows taxable valuation for the different minerals in the counties.

Local ad valorem property taxes are levied on the taxable valuation of oil and gas equipment. Rates are the same as those for ad valorem production, but the taxable valuation of oil and gas equipment is 11.5 percent of the assessed value (Grenvik 2005; Wyoming DOR 2001b).

Federal royalties on production of oil, gas, and surface coal are levied at 12.5 percent of the value of production, after allowable deductions. Federal royalties on underground coal are levied at 8 percent of the value of production; note that the only active production site for underground coal in the planning area is the Jim Bridger Mine in Sweetwater County. Half the royalties collected and the net of a 1 percent administrative processing fee are returned to Wyoming; a portion of the royalties the state receives are disbursed to cities and towns (State of Wyoming 2004). Federal mineral royalties are also collected on production of other minerals. The rate on trona production has been 6 percent since 1995, but in the fall of 2006 was reduced to 2 percent, which will be the effective rate for at least the next 5 years (Hardy 2006). According to the Wyoming Consensus Revenue Estimating Group, federal mineral royalties for production in the state were \$927 million in Fiscal Year 2007 and \$1,186 million in Fiscal Year 2008 (CREG 2009a). This includes royalties from oil, gas, and gas plant products, and coal, including coal lease bonuses. The Wyoming Consensus Revenue Estimating Group projects lower royalty revenue for the next several fiscal years due to lower gas prices and other factors (CREG 2009a).

The state sales tax applies to retail purchases of goods and some services in Wyoming, while the use tax applies to a retail purchase of goods outside Wyoming by firms in Wyoming (Wyoming DOR 2006). For example, for the oil and gas industry, a firm with operations in Wyoming that purchases equipment from outside the state for use in state would remit use taxes to the State of Wyoming for the purchase.

Property Tax and Sales Tax Base (Tax Revenues)

The fiscal stability of local and state governments, and the economic viability of communities themselves, depends on the viability and stability of local industry and commerce. Table 3.75, "Local and State Assessed Property Valuation, 2007" (p. 573) lists local and state assessed property valuation in 2007 for the planning area counties and Wyoming.

Table 3.75. Local and State Assessed Property Valuation, 2007

County	Total (\$ millions)	Agricultural (Percent)	Residential (Percent)	Commercial (Percent)	Mineral (Percent)	Industrial (Percent)
Local Assessed Valuation						
Carbon County	201	4	39	9	45	2
Fremont County	345	3	59	14	22	2
Hot Springs County	41	7	61	17	14	1
Natrona County	662	1	66	24	7	2
Sweetwater County	562	1	36	12	46	5
State of Wyoming	7,135	3	60	14	21	2
State Assessed Valuation						
Carbon County	695	0	0	0	90	10
Fremont County	504	0	0	0	96	4
Hot Springs County	154	0	0	0	95	5
Natrona County	397	0	0	0	90	10

County	Total (\$ millions)	Agricultural (Percent)	Residential (Percent)	Commercial (Percent)	Mineral (Percent)	Industrial (Percent)
Sweetwater County	1,831	0	0	0	91	9
State of Wyoming	14,763	0	0	0	94	6
Total (State and Local) Assessed Valuation						
Carbon County	896	1	9	2	80	8
Fremont County	848	1	24	6	66	3
Hot Springs County	848	1	24	6	66	3
Natrona County	1,059	1	41	15	38	5
Sweetwater County	2,394	0	9	3	80	8
State of Wyoming	21,898	1	20	5	70	5
Source: Wyoming DOR 2008						

Consistent with other data in this section, the property tax base in the planning area counties is relatively well diversified (compared to the state average). Mining contributes a relatively large share to the local property tax base in all counties, while agricultural uses contribute less to local property valuation. In all the counties, residential and commercial property provide important contributions to local assessed valuation. Mining contributes the largest amount to state assessed valuation in all the counties.

Table 3.76, “State and Local Sales Tax Collections by Sector, 2008 (percent)” (p. 574) lists local and state sales tax revenues by sector for each of the counties. Along with the data on property tax valuations, the table on sales tax collections by sector provide insight into the economic base of the counties. Retail trade contributes the largest share of sales tax revenues in all the counties. Several other sectors, such as wholesale trade, utilities, mining, leisure and hospitality, and public administration, also contributed substantial shares.

Table 3.76. State and Local Sales Tax Collections by Sector, 2008 (percent)

Sector	Carbon County	Fremont County	Hot Springs County	Natrona County	Sweetwater County	State of Wyoming
Agriculture, Forestry, Fishing, and Hunting	0.1	0.04	0.01	0.001	0.02	0.04
Mining	29	15	20	7	26	17
Utilities	3	2	9	3	3	4
Construction	3	2	2	3	2	3
Manufacturing	2	2	1	4	5	4
Wholesale Trade	9	8	8	15	12	12
Retail Trade	26	41	27	39	29	33
Transportation and Warehousing	0.1	0.1	0.03	0.1	0.3	0.2
Information	2	3	3	1	2	2
Financial Activities	6	3	2	4	5	4

Sector	Carbon County	Fremont County	Hot Springs County	Natrona County	Sweetwater County	State of Wyoming
Professional and Business Services	0.4	1.0	0.3	1	1	1
Educational and Health Services	0.01	0.1	0.02	0.04	0.1	0.1
Leisure and Hospitality	10	8	13	8	6	10
Other Services	3	4	3	4	4	4
Public Administration	7	11	11	11	5	7
Total (\$ millions)	28.2	37.1	4.8	103.1	106.5	849

Source: Wyoming Economic Analysis Division 2008

Separate data on sales tax revenues from retail trade, accommodation, and food sales (Table 3.77, “Retail, Accommodation, and Food Sales – State and Local Sales Tax Collections, 2008 (percent)” (p. 575)) provide some additional insight into the contribution from elements that might be related to travel and tourism specifically (e.g., eating and drinking establishments and lodging). A sizable portion of tax collections from eating and drinking establishments also accrue from local residents, and a portion of gasoline station tax collections would also accrue from tourists and business travelers. These data suggest that travel and tourism provide an important contribution to sales tax collections in the study area counties. This is particularly true for Hot Springs County, where eating and drinking establishments and lodging contribute 31 percent of the sales tax collections attributable to retail, accommodation, and food sales (about \$0.6 million annually), and Carbon County, where these subsectors account for 27 percent of the sales tax collections attributable to retail, accommodation, and food sales (about \$2.7 million annually).

Table 3.77. Retail, Accommodation, and Food Sales – State and Local Sales Tax Collections, 2008 (percent)

Sector	Carbon County	Fremont County	Hot Springs County	Natrona County	Sweetwater County	State of Wyoming
Auto Dealers and Parts	6	7	3	8	9	8
Building Material and Garden Supplies	20	20	30	14	15	15
Clothing and Shoe Stores	1	1	1	4	3	3
Department Stores	4	4	0	6	3	4
Eating and Drinking Places	13	12	17	13	12	14
Electronic and Appliance Stores	2	3	3	6	2	5
Gasoline Stations	13	8	6	4	12	8

Sector	Carbon County	Fremont County	Hot Springs County	Natrona County	Sweetwater County	State of Wyoming
General Merchandise Stores	7	22	6	20	12	14
Grocery and Food Stores	5	4	5	2	4	3
Home Furniture and Furnishings	1	1	1	3	3	3
Liquor Stores	1	2	1	2	1	2
Lodging Services	14	3	14	3	6	8
Miscellaneous Retail	14	13	14	15	17	15
Total (\$ millions)	10	18	2	48	38	359
Source: Wyoming Economic Analysis Division 2008						

Travel, Tourism, and Recreation

BLM management actions also affect travel and tourism, both directly (through decisions that affect access to recreation) and indirectly (through decisions that affect wildlife populations). The State Office of Travel and Tourism estimates that in 2007, travel and tourism accounted for \$107 million in tax revenues, including \$65 million (rounded figure) in state revenues and \$43 million (rounded figure) in local revenues (2007 dollars), not including property tax collections related to recreation infrastructure (Dean Runyan Associates 2008). Most trips (an estimated 98 percent) are due to tourism for pleasure (WTT 2007). Table 3.78, “Local and State Tax Receipts due to Travel and Tourism in Study Area Counties and Wyoming in 2007 (\$ million)” (p. 576) lists tax receipts for the counties in the study area. This study does not include spending by local residents on recreation.

The study also does not include tourism that is not measured through tax receipt. The Impact Analysis for Planning Model (IMPLAN) system does not capture the economic impact of NOLS, one of the largest outfitters in the United States. In 2010, NOLS paid \$7,200,000 in annual payroll for 125 full time and 50 seasonal staff, and 300 seasonal field instructors in Fremont County. The school spent \$350,000 on food in the State of Wyoming in 2010, \$53,000 on fuel for vehicles in Wyoming, and \$50,000 on vehicle maintenance. Further, NOLS paid \$110,000 to Wyoming outfitters in 2010. The IMPLAN approach to measuring tourism is through counting hotel stays. However, 1,200 students attending NOLS courses (and, thus, at least 2,400 hotel stays) stayed in the Noble Hotel, the NOLS dormitory. These students shopped locally, including through NOLS, for provisions, equipment, clothing and other articles, and patronized local restaurants and stores.

Table 3.78. Local and State Tax Receipts due to Travel and Tourism in Study Area Counties and Wyoming in 2007 (\$ million)

County	Local Tax Receipts	State Tax Receipts	Total Tax Receipts
Fremont	\$1.0	\$3.0	\$4.0
Carbon	\$2.4	\$4.4	\$6.8
Hot Springs	\$0.4	\$0.7	\$1.1
Natrona	\$3.6	\$6.4	\$10.0
Sweetwater	\$3.0	\$4.7	\$7.7
Wyoming	\$43.2	\$64.6	\$107.8
Source: Dean Runyan Associates 2008			

Table 3.79, “Local and State Tax Receipts due to Travel and Tourism, 2001-2007 (\$ million)” (p. 577) lists trends in local and state tax receipts for counties in the planning area from 2001 through 2007. Note that the data in the table are in current dollars; that is, they are not adjusted for inflation. The table shows that local and state tax receipts rose slowly but steadily between 2001 and 2007 for all five counties in the planning area and in the state. Among the five counties, tax receipts are consistently highest in Natrona County.

Table 3.79. Local and State Tax Receipts due to Travel and Tourism, 2001-2007 (\$ million)

County	2001	2002	2003	2004	2005	2006	2007
Local Tax Receipts							
Fremont	0.6	0.7	0.7	0.7	0.8	0.9	1.0
Carbon	1.5	1.5	1.5	1.6	1.9	2.3	2.7
Hot Springs	0.3	0.3	0.3	0.3	0.4	0.4	0.4
Natrona	2.1	2.2	2.3	2.5	2.8	3.1	3.6
Sweetwater	1.5	1.8	1.9	2.1	2.4	2.8	3.0
Wyoming	28	30	31	32	36	40	43
State Tax Receipts							
Fremont	2.3	2.3	2.4	2.5	2.6	2.8	3.0
Carbon	3.0	3.0	3.0	3.1	3.4	3.9	4.2
Hot Springs	0.5	0.5	0.5	0.5	0.6	0.7	0.7
Natrona	4.7	4.7	4.9	5.1	5.5	6.0	6.4
Sweetwater	3.4	3.3	3.5	3.7	4.1	4.5	4.7
Wyoming	50	50	51	52	56	61	65
Sources: Dean Runyan Associates 2007; Dean Runyan Associates 2008							
Note: Data are in current dollars (not adjusted for inflation).							

Livestock Grazing and Ranching

Livestock grazing and ranching, and agriculture more generally, contribute directly to local and state tax revenues from local ad valorem property taxes and local and state sales and use taxes. According to a 2003 report on state and local tax revenues, agriculture, along with forestry, fishing, and hunting, brought in \$9.2 million in state and local tax revenues due to ad valorem property taxes, and \$1.4 million due to sales and use taxes, for a total of more than \$10.6 million (WLSO 2003).

Economic Considerations on the Wind River Indian Reservation

Due to the size of the WRIR and its location within the Lander Field Office, it is important to note the economic contributions of the reservation. The Northern Arapaho, who constitute about 54 percent of the Native American population on the WRIR (U.S. Census Bureau 2000a), operate three casinos on the reservation (Wind River Casino, Little Wind Casino, and 789 Smoke Shop & Casino). The Eastern Shoshone, who constitute about 30 percent of the Native American population on the reservation, operate one casino (Shoshone Rose Casino). These are the only casinos in the State of Wyoming. The casinos provide job opportunities for Native Americans and other people, both directly and indirectly (through a multiplier effect). Although the casinos in Wyoming do not pay state taxes on their proceeds (NCSL 2004), they do provide revenue to the state via other sources, such as sales taxes and hotel occupancy taxes. A 2008 report commissioned by the Northern Arapaho tribe found that the three Northern Arapaho casinos generated \$90 million in economic activity, including multiplier effects, \$800,000 in county sales tax revenue, and \$1.6 million in state sales tax revenue (NativeBiz 2009, Over 2009).

In addition to the casino business, several other initiatives generate economic activity. For example, the Northern Arapaho Tourism Information Council, a recently established nonprofit organization, plans to develop several recreational and cultural attractions for visitors to the WRIR. The Northern Arapaho Tourism Information Council has no projects currently under construction, but ideas for future projects include a visitor center, a site commemorating the Sand Creek Massacre Trail, and concessions from which native guides could take visitors to the best spots for hunting and fishing on the WRIR. These projects would require additional funding and approvals from several different agencies on the WRIR. Thus, the schedule for implementation is not known at this time (Barela 2009, Northern Arapaho Public Relations Department 2009).

3.8.3. Health and Safety

The BLM addresses a variety of potential hazards on public surface lands to reduce risks to visitors and employees. Hazards include hazardous materials; mine shafts and adits; abandoned equipment and structures; explosives and munitions; natural geologic hazards; and spills from pipelines, tankers, and storage tanks.

Abandoned Mine Lands

Extreme physical hazards are common at abandoned mine sites, and for visitors, these hazards are not always apparent. Abandoned mine sites have proven to be a luring and sometimes life-threatening attraction for both children and adults. Serious injury or death could occur at these sites. Common hazards include open vertical shafts; unstable overhead rock and decayed support structures; deadly gases and lack of oxygen; remnant explosives and toxic chemicals; high walls, open pits, and open drill holes; and becoming lost and disoriented while underground. Subsidence at abandoned coal mines and coal fires pose additional hazards.

Abandoned mines are a common feature on BLM-administered lands. The BLM has identified 934 known AML sites throughout the State of Wyoming (BLM 2009f). Remediation projects have begun at several of these sites, including projects within the planning area such as the Gas Hills Haul Road, for which the BLM completed remediation in 2004; the South Pass mining area, for which the BLM has partially completed remediation; and the Copper Mountain mines, for which remediation is pending (BLM 2009g). Several additional AML sites on BLM-administered lands in the Copper Mountain and South Pass areas were reclaimed in 2009 and 2010, such as the Carrie Shields Mine near South Pass City. Many additional sites in the planning area, especially in the South Pass area, await reclamation. Also, the Gas Hills and Crooks Gap areas have had many AML reclamation projects for old uranium mines.

The Wyoming State Office of the BLM has a prioritized list of AML sites that pose the greatest risk to people and the environment. AML sites affecting water quality are addressed using the watershed approach. Using this approach accomplishes the following objectives:

- Allows for mitigation to be risk-based by identifying priority sites first
- Fosters collaborative efforts across federal, state, and private administrative boundaries
- Considers all issues important to water resource protection
- Reduces the cost of mitigation

- Provides the most efficient method of remediating AML sites by utilizing a wide range of available resources

The most substantial type of mine hazard features in the planning area are open shafts, adits, and high-walls remaining at AML sites in the South Pass mining district (recreation concerns), and at the Copper Mountain mining district (high use area). The South Pass mining district and the Copper Mountain mining district have been prioritized as hazardous areas due to the severity of hazards (falling, entrapment), proximity to population centers, and likelihood of access (recreation) (BLM 2009a). Final reclamation of these sites has not been accomplished; therefore, the BLM created a temporary fencing program to immediately address safety concerns. The BLM completed fencing at over 10 sites in late fall 2008. Further work is planned to address other fencing needs and to bring additional hazardous and abandoned sites to closure through a final reclamation solution.

In 2004 and 2005, the BLM and the Wyoming DEQ, AML Division signed cooperative agreements that further facilitated the reclamation of AML sites on BLM-administered lands. The state program, as required by the Surface Mining Control and Reclamation Act of 1977, focuses on public safety hazards. In addition, the BLM has received some funding within its Soil, Water, and Air Program to address environmental hazards and watershed concerns associated with abandoned mines on a site-specific basis. Starting in Fiscal Year 2011, reclamation of safety hazards will be under a separate BLM AML subactivity; the Soil, Water and Air subactivity will continue to address hazards affecting water quality. By combining available funding, safety hazards and environmental impacts to water quality and watershed function can continue to be addressed in a more comprehensive way at priority AML sites.

The Wyoming DEQ, AML Division works closely with federal land management agencies, private land owners, and the general public to ensure that the views of all interested parties are considered in the reclamation process. According to an August 2007 fact sheet, the projected budget for the Wyoming DEQ, AML Division is \$69 to \$149 million annually for Calendar Years 2009 through 2015 (Wyoming DEQ No Date-a). These funds will be used to identify and reclaim AMLs and to construct public works projects in communities adversely affected by mining activities. According to the Wyoming DEQ AML Division Coordinator, the state AML program will focus on abandoned coal mines in the foreseeable future (Wyoming DEQ 2008b). However, the BLM will continue to identify and remediate abandoned mine hazards in concert with the Wyoming DEQ, AML Division and on its own.

Other Hazards

Other hazards identified in the planning area include unexploded ordinance and other hazards associated with formerly used defense sites, and hazardous materials and wastes. Hazardous materials are used and/or stored in connection with a variety of permitted activities on BLM-administered land, including oil and gas drilling and mining. Air, soil, surface water, and groundwater contamination can be found at sites associated with hazardous material use and storage.

Earthquakes, landslides, and rockslides are natural geological hazards that pose a potential threat to public health and safety in the planning area. There has been seismic and volcanic activity in the Greater Yellowstone area throughout the past several million years; hazards include earthquakes, as well as ash falls from volcanic eruptions. While most of the planning area is in a moderate earthquake zone, the likelihood of seismic activity increases with proximity to the Teton Range. There are fault lines in the planning area, particularly in the southeastern corner and along

the Wind River fault. Rockslides and landslides also pose a potential threat in the planning area. Rock type and percent slope are factors that contribute to the potential for rockslides.

Management Challenges for Health and Safety

Successful reclamation of AML sites is a management challenge in the planning area. AML sites can be difficult to reclaim and remediation must be considered before starting new mining activity or other development. In addition, the repurposing of AML sites in the planning area poses a challenge due to the contaminated nature of many of the sites. Reclaimed lands are sometimes suitable for repurposing for other uses, such as for siting communications towers, transmission lines or renewable energy development. However, many of the AML sites in the planning area are radioactive or otherwise contaminated and are not suitable for other uses. Assessment for repurposing must be performed on a site-specific basis.

3.8.4. Environmental Justice

Environmental justice pertains to the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, regarding the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the adverse environmental or human health consequences or be denied benefits from federal, state, local, and tribal programs and policies (Executive Order 12898 – Federal Actions to Address Environmental Justice In Minority Populations and Low-Income Populations).

The BLM incorporates both the “fair treatment” and “meaningful involvement” aspects of environmental justice into its planning process. To address the “meaningful involvement” aspects of environmental justice, the BLM provides low-income, minority, and Native American populations the opportunity to be involved in the planning process through public involvement, scoping, consultation and coordination, and comment periods during the development of this RMP revision. Refer to the *Consultation and Coordination* section of Chapter 5 in the RMP for additional information.

To address “fair treatment” aspects of environmental justice, the environmental analysis in the EIS includes an analysis of all human health and environmental impacts (including impacts on the physical or natural environment) that could affect low-income populations, populations of racial and ethnic minorities, and Native American tribes. This analysis identifies any disproportionately high and adverse human health or environmental impacts on these populations. The analysis in the EIS also addresses whether low-income and minority populations have equal access to the benefits provided by the alternatives. To determine what environmental impacts are “disproportionately high and adverse,” BLM considers three factors (Council on Environmental Quality 1997), as follows:

- a. whether there is or will be an impact on the natural or physical environment that significantly and adversely affects a minority population, low-income population, or Native American tribe. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities, low-income communities, or Native American tribes when those impacts are interrelated to impacts on the natural or physical environment;
- b. whether environmental effects are significant (as employed by NEPA) and are or may be having an adverse impact on minority populations, low-income populations, or Native

American tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group; and

- c. whether the environmental effects occur or would occur in a minority population, low-income population, or Native American tribe affected by cumulative or multiple adverse exposures from environmental hazards (Council on Environmental Quality 1997).

In considering environmental justice, it is important to recognize that both local residents and transitory low-income and minority populations can be users of public lands. The BLM does not have data to identify whether non-area users of the public lands are low-income or minority populations. Because of the lack of good data concerning low-income and minority populations from residents outside the planning area, this section focuses on residential demographics.

Minority and Low-Income Populations

IM 2002-164 defines minority persons as “Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other nonwhite persons.” Furthermore, IM 2002-164 indicates that an area should be considered to contain a minority population where either the minority population of the affected area exceeds 50 percent, or the percentage of minority population in the affected area is meaningfully greater than the percentage in the general population.

Table 3.80, “Minority Populations in 2000 and 2008; Low-Income Populations in 2000 and 2007” (p. 582) lists the percent of minority and low-income populations in the counties in the planning area compared to the United States and Wyoming. Most of the population in the planning area resides in Fremont County. Note that the economic data for the WRIR influence the data for Fremont County as a whole. Unemployment is higher on the reservation, as is the percentage of people in poverty (Table 3.80, “Minority Populations in 2000 and 2008; Low-Income Populations in 2000 and 2007” (p. 582)).

The Council on Environmental Quality (CEQ) guidance for environmental justice analysis under NEPA notes that agencies may consider as a community “either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect” (Council on Environmental Quality 1997). The CEQ guidance also indicates that low-income populations should be identified with the statistical poverty thresholds from the Census Bureau. These thresholds are defined differently for different household sizes and numbers of dependents. For example, the threshold for a two-parent family with no children is different from the threshold for a single parent with five children. Thus, the Census Bureau poverty thresholds comprise a 48-cell matrix that varies by family size and composition. Because the Census Bureau collects data on income and family composition for individual households, the agency can compare family-level income data to the applicable threshold. In 2007, the Census poverty threshold for a family of two adults and two children was \$21,027 (U.S. Census Bureau 2007).

Although the CEQ guidance does not provide a quantitative threshold (such as a limit on the percent of persons in poverty) for determining whether a population should be considered low-income, typically, the percent of persons in poverty in the study area is compared to that in a larger geographic comparison area, such as the state or the overall planning area. Neither the CEQ, EPA, or BLM guidance specifies quantitative criteria for what constitutes a low-income population.

Table 3.80. Minority Populations in 2000 and 2008; Low-Income Populations in 2000 and 2007

County	Percent Minority Population in 2000	Percent Minority Population in 2008	Percent in Poverty in 2000	Percent in Poverty in 2007
Carbon	17	19	13	10
Fremont	25	27	18	13
Hot Springs	5	7	11	11
Natrona	8	10	12	10
Sweetwater	13	17	8	7
Wind River Indian Reservation ¹	34	33 ²	21	N/A ³
Wyoming	11	13	11	10
United States	31	34	12	13

Sources: U.S. Census Bureau 2000a; U.S. Census Bureau 2008a; U.S. Census Bureau 2008c; U.S. Census Bureau 2009a; U.S. Census Bureau 2009b; U.S. Census Bureau 2009c

¹The Census Bureau defines the Wind River Indian Reservation (WRIR) as including the towns of Riverton, Shoshoni, Pavillion, and Hudson.

²Data for 2008 for the WRIR are not available; the data shown are for a three-year sample covering 2005 through 2007.

³The most recent poverty data available for the WRIR are for 2000.

Table 3.81, “Racial and Ethnic Groups for Planning Area Counties, WRIR, and Wyoming (percent)” (p. 583) summarizes the study area population by race and ethnicity for major racial and ethnic groups. In Carbon, Hot Springs, Sweetwater, and Natrona Counties, the largest ethnic or racial group other than non-Hispanic whites is Hispanic or Latino (of any race). In Fremont County, and for the WRIR, Native Americans constitute the largest ethnic or racial group other than non-Hispanic whites. The percent of racial “minorities” (people other than non-Hispanic whites) is greater than that for the state in Carbon, Fremont, and Natrona Counties. Note that Hispanic/Latino denotes an ethnicity, and people of this ethnic background can be of any race.

Table 3.81. Racial and Ethnic Groups for Planning Area Counties, WRIR, and Wyoming (percent)

Race or Ethnicity	Carbon County	Fremont County	Hot Springs County	Sweetwater County	Natrona County	WRIR	State of Wyoming
Non-Hispanic, White	81	73	93	90	83	67	87
Non-Hispanic, Black	1	1	1	1	1	0	1
Non-Hispanic, American Indian/Alaska Native	1	19	2	1	1	25	2
Non-Hispanic, Asian, Native Hawaiian, or Other Pacific Islander	1	1	0	1	1	1	1
Non-Hispanic, some other race, or two or more races	1	2	1	1	2	2	1
Hispanic or Latino (of any race)	15	6	3	6	12	6	8
Sources: U.S. Census Bureau 2009a (counties); U.S. Census Bureau 2009b (state); U.S. Census Bureau 2008a (WRIR)							
Note: County data are for 2008. WRIR data are from a rolling survey collected in from 2005 to 2007.							
WRIR Wind River Indian Reservation							

The WRIR is downstream of public lands in the northwestern and southern Wind River drainages and could be affected by BLM management decisions that affect water quality or quantity. A wide range of activities have the potential to impact the WRIR, such as activities affecting air quality or activities that could impact the WRIR gaming industry, incipient tourism industry (see the *Economic Conditions* section), or livestock grazing operations.

Table 3.82, “Population, Racial and Ethnic Groups, and Poverty for Tribal Census Tracts of the WRIR, 2000” (p. 584) provides data on minority and low-income populations in Tribal Census Tracts of the WRIR, and Map 133 shows the locations of the Tribal Census Tracts. The percentage of Native American residents is greatest in Tribal Census Tract 9401, which constitutes the western half of the WRIR, and second greatest in Tribal Census Tract 9402, which constitutes most of the eastern portion. In Tracts 9403, 9404, and 9405, which comprise Riverton and its immediate surroundings, the percent of Native American people is much lower. Poverty is also greatest in Tracts 9401 and 9402.

Note that the table shows the most recent data tabulated for the tracts of the WRIR, but these data are from 2000 and do not correspond exactly to the data provided above for the WRIR from 2005 though 2007. Also, note that the table does not provide data for Tribal Census Tract 9876 because, according to the U.S. Census Bureau, only one person lives in that tract.

Table 3.82. Population, Racial and Ethnic Groups, and Poverty for Tribal Census Tracts of the WRIR, 2000

Data Item	WRIR	Tribal Census Tract 9401	Tribal Census Tract 9402	Tribal Census Tract 9403	Tribal Census Tract 9404	Tribal Census Tract 9405
Total Population	23,245	3,483	7,548	5,103	4,751	2,364
Non-Hispanic, White (percent)	66	15	59	79	88	86
Non-Hispanic, Black (percent)	0	0	0	0	0	0
Non-Hispanic, American Indian/Alaska Native (percent)	27	81	35	10	4	5
Non-Hispanic, Asian, Native Hawaiian, or Other Pacific Islander (percent)	0	0	0	0	0	0
Non-Hispanic, some other race, or two or more races (percent)	2	1	2	2	2	2
Hispanic or Latino (of any race) (percent)	5	3	3	8	5	7
Percent of Population in Poverty (percent)	21	34	23	19	10	21
Source: U.S. Census Bureau 2000a						
Note: Data for Tribal Census Tract 9876 are not shown because, according to the U.S. Census Bureau, only one person resides in this area.						
WRIR Wind River Indian Reservation						

3.8.5. Tribal Treaty Rights

The WRIR is located within the Lander Field Office planning area. The WRIR is Wyoming's only Native American Indian Reservation. The WRIR is home to the Eastern Shoshone and Northern Arapaho and was established by the 1868 Treaty of Fort Bridger, as amended.

Judicially established lands are defined based on information provided by the Indian Claims Commission and approximating tribal lands that are determined by the ethnographic and historic literature. The NPS (NPS 1993) indicates that the judicially established Crow lands are within the planning area. The Shoshone have judicially established Indian Lands adjacent to the Lander

Field Office. Other tribes have judicially established land nearby, but outside the planning area boundaries.

There are no trust lands or tribal properties outside the WRIR in the planning area. Tribal roles and responsibilities are not well defined in the existing plan, although BLM land use plans must address the protection of any treaty rights. The BLM works closely with the WRIR regarding planning issues. Because of the fiduciary responsibilities the BLM holds for tribal mineral rights, the agency is particularly cognizant of tribal and treaty obligations.

In compliance with the AIRFA of 1978, the NHPA of 1966, the Archaeological Resources Protection Act of 1979, the NAGPRA of 1990, and other Executive and Secretarial Orders (BLM Manual 8120), the BLM consulted with Native American tribes during the RMP revision process. The intent of tribal consultation is to help the BLM identify and design management for significant religious or cultural properties (TCPs); to understand tribal concerns; to identify public land places, resources, uses, and values important to the tribes and/or tribal members; and to identify land management decisions and procedures that conflict with Native Americans' religious observations. Tribal consultation during the RMP revision process is in accordance with BLM guidance, and the BLM has considered information resulting from tribal consultations in the impacts analysis. The *Consultation and Coordination* section of Chapter 5 identifies the tribes involved in consultation efforts for this RMP revision. It is BLM policy to keep in trust confidential information received through tribal consultations.

Treaty Rights and Trust Responsibilities Policy

A treaty is a formal agreement between the United States government and a Native American tribe or tribes that cedes land or reserves rights to the tribe(s). Executive Order 13084, Consultation with Indian Tribal Governments, and Executive Order 13007, Indian Sacred Sites, provide the framework for involving Native American tribes in the BLM planning process. BLM Manual 8120, Tribal Consultation provides additional guidance.

3.9. Climate Change

A growing body of evidence indicates that the Earth's atmosphere is warming. Records show that surface temperatures in the Wyoming region have risen approximately 1.5°F since the 1960 to 1979 baseline years (GCRP 2009a). The largest increase in average temperature has occurred in the winter months in the northern portions of the region. Relatively cold days in the region are becoming less frequent and relatively hot days are becoming more frequent (GCRP 2009a). Globally, observed changes in oceans, ecosystems, and ice cover are consistent with this warming trend (National Academy of Sciences 2006). Ongoing scientific research has identified the potential impacts of GHG emissions, including CO₂, CH₄, N₂O, water vapor, and several trace gases on global climate change. Through complex interactions at regional and global scales, these GHG emissions cause a net warming of the climate by increasing the amount of heat energy absorbed by the atmosphere. Although GHG concentrations in the atmosphere and climatic conditions have varied throughout the Earth's history, recent industrialization and burning of fossil fuels has caused global atmospheric CO₂ concentration to increase; this most recent CO₂ increase is likely to contribute to overall climatic changes (National Academy of Sciences 2006).

Global atmospheric concentrations of CO₂, CH₄, and N₂O have increased as a result of human activities since 1750 and now exceed pre-industrial values (as determined from ice cores spanning many thousands of years). The global increase in CO₂ concentrations is due to fossil fuel use and

land use change, while those of CH₄ and N₂O are due to agricultural soil management, animal manure management, sewage treatment and mobile and stationary combustion of fossil fuels (IPCC 2007a, EPA 2009b).

According to climate change research, the impacts of climate change are expected to vary by region, season and time of day (National Academy of Sciences 2006, GCRP 2009a). Computer model forecasts indicate that increases in temperature will not be evenly or equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures (National Academy of Sciences 2006). Within a given region, increasing temperatures may also affect the amount of soil moisture and atmospheric water vapor, the timing and amount of precipitation and snow melt, and the intensity of storm systems. All of these factors may affect the climate, day-to-day weather conditions, water quality and quantity, soil conditions, vegetation, fire intensity and frequency, air quality, and other resources in the planning area.

All of North America is likely to experience an increase in average temperature during the next 100 years, and the annual mean warming in most areas is likely to exceed the global mean warming (IPCC 2007a). Temperatures in the planning area are projected to increase by the end of the current century (GCRP 2009a). Summer temperatures in the planning area are expected to increase between approximately 3°F and 10°F by 2080-2099 (GCRP 2009a, GCRP 2009b). Overall, the temperature in the region that includes the planning area is projected to increase between 2.5°F to more than 13°F compared with the 1960 to 1979 baseline, depending on future GHG emissions (GCRP 2009a). This range of temperature increases reflects the current uncertainty in climate change modeling and represents the likely range of model projections, though lower or higher outcomes are possible.

The lack of scientific tools (models with sufficient spatial and temporal resolution) to forecast climate change at even regional scales limits the ability to quantify current and future impacts of climate change in the planning area. Potential future impacts of climate change that can be reasonably anticipated for the planning area are described below; however, some of these impacts may already be occurring in the area.

Increasing temperatures in the planning area are likely to contribute to increased evaporation, drought frequency, and declining water quantity and quality, which will add additional stress to water resources in the region. The planning area is also dependent on temperature sensitive springtime snowpack to meet demand for water from municipal, industrial, agricultural, and recreational uses as well as BLM-authorized activities. Higher temperatures are causing more winter precipitation to fall as rain rather than snow, which is reducing snowpack and contributing to earlier snowmelt. Continuing declines in snowmelt associated with climate change are projected, which would reduce the amount of water available during summer months (GCRP 2009b). As glaciers in the Wind River Mountains continue to recede, annual spring runoff will occur sooner and could have smaller discharges. Lower levels of water would likely result in degradation of water quality including temperature increases, loss of high flows need to mix and flush pollutants, increased sedimentation, and degradation or loss of habitats.

Shifting precipitation patterns are projected across the Rocky Mountain region as a result of climate change (NPS 2010). It is estimated that in the region, precipitation could increase 2 to 5 percent in winter, and decrease 0 to 4 percent in summer (NPS 2010). While increases in winter precipitation could result in heavier snowpack in the mountains, reductions in summer

precipitation and warmer temperatures that result in early spring snowmelt would couple to reduce the water availability during the dry summer season. These predicted changes in precipitation can affect the distribution of flora and fauna across the landscape and combine with other stressors to increase the risk of wildfire and insect outbreaks.

Increases in average summer temperatures and earlier spring snowmelt in the planning area are also expected to increase the risk of wildfire occurrence by increasing summer moisture deficits (GCRP 2009a). Drought and the resulting stress on vegetation is likely to increase the frequency and intensity of mountain pine beetle and other insect infestations. Increases in insect infestations and tree mortality can also result from fluctuations in climatic patterns, such as warmer and drier summer conditions and warmer winters. Forest communities are resilient when responding to normal variations in weather to which they are adapted; however, climate change may alter precipitation patterns and extreme weather events too rapidly for forests and other vegetation to adapt. The synergistic impacts of drought, insect infestations, fluctuations in precipitation and climate, fire frequency and occurrence, and other factors would likely require specialized management in forests and other vegetated areas, especially where stands are currently overstocked.

Climate change is likely to combine with other human induced stress to further increase the vulnerability of ecosystems to pests, invasive species, and loss of native species. Breeding patterns, water and food supply, and habitat availability would all likely be affected by climate change to some degree. Sensitive species in the planning area such as the greater sage-grouse, which are already stressed by factors such as declining habitat and increased development, could experience additional pressures as a result of climate change. If glacial retreat or early snowpack melt continues, perennial waterbodies may become intermittent and unable to support fish populations. Increasing temperatures and shifting precipitation patterns may also increase the prevalence of plants with C4 photosynthetic pathways, such as cheatgrass and other invasive plant species, in higher elevations, which typically prefer warmer temperatures (Skillman et al. 2010).

A variety of activities in the planning area generate GHGs. Direct GHG emissions result from the combustion of fuels and industrial processes, as well as from any number of other activities that occur on public lands. Direct emissions occurring in the planning area include those related to oil and gas and other minerals development, fire events, motorized vehicle use (e.g., OHVs), livestock grazing, facilities development, and fugitive emissions. Indirect GHG emissions and other contributions to climate change in the planning area include the use of electricity generated outside the area, heat and steam, land use changes (conversion of land to less reflective surfaces that absorb heat, such as concrete or pavement), and soil erosion (which can reduce snow's solar reflectivity and contribute to faster snow melt).

BLM-administered land and public lands in general also play an important role in combating further climate change. Vegetation and soil provide carbon sequestration, which is the storage and removal of CO₂ or other forms of carbon from the atmosphere. Management strategies to improve vegetative and soil health provide opportunities for increased carbon sequestration. For example, the need to maintain and improve vegetative condition required by the Wyoming Standards for Healthy Rangelands (Appendix J (p. 1537)) can result in increased carbon sequestration.

Adaptive management is a useful management approach to appropriately anticipate and respond to the uncertainty of impacts resulting from climate change. Adaptive management is useful for complex processes and where potential impacts are large and could affect multiple resources. Adaptive management strategies are iterative processes where monitoring and assessment refine

management. This document is based on current scientific knowledge and understanding, which in the case of climate change, is still emerging. Adaptive management provides for new information to be evaluated and incorporated into project level management decisions, BMPs, mitigation and the decision-making process. Adapting management to reflect emerging science, projections, and impacts of climate change allows the BLM to adjust management to best meet the challenges of climate change. Additional information on adaptive management can be found in Chapter 2 of this document.

Additional and up to date information on climate change projections, impacts, and other related issues can be found through the U.S. Global Change Research Program (<http://www.globalchange.gov/>) and the Intergovernmental Panel on Climate Change (<http://www.ipcc.ch/>).